ENGINEERING NEWS-RECORD

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A Conference on—

Federal Aid for Sewage Works Construction

ENR asks experts to air their views *p. 40*

A McGRAW-HILL PUBLICATION

E B POWER
UNIVERSITY MICROFILMS IN
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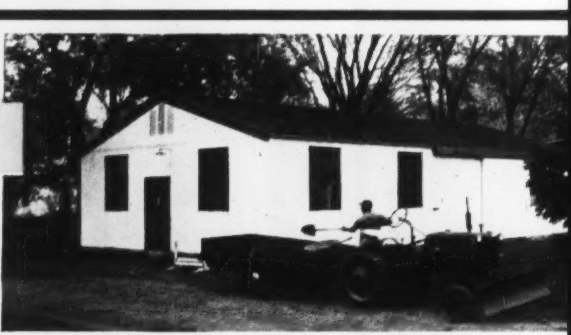
GS N

Look how these cities got

low-cost, easy-to-maintain building

For recreation

Armco Steel Building houses recreation facilities in city park, La Grange, Indiana. Smooth sidewalls are neat; easy to paint. There are no maintenance problems, nothing to crack, warp or rot.



Education

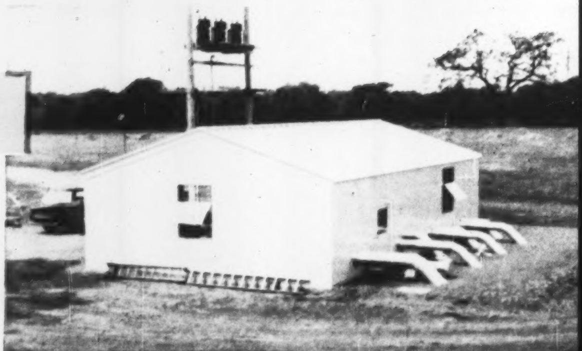
Fast, low-cost erection means you can meet classroom needs quickly with Armco Buildings. STEELOX Panel construction assures weather-tightness. This 4-room school addition is in Rome, New York.

City business

Airport administration building at Mayfield, Kentucky. Armco Steel Buildings can be finished as simply or elaborately as desired. Notice how the special entrance and shutters provide an attractive "colonial" treatment.

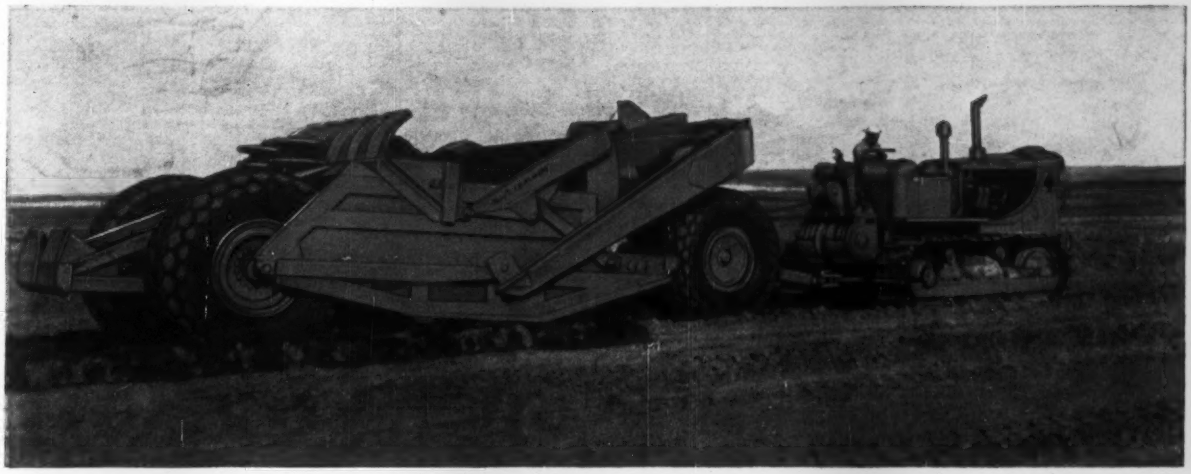
And service

The city of Santa Rosa, California, chose this Armco Building to house chlorination and pumping facilities for the water treatment system. The wide range of types and sizes of Armco Buildings makes them ideal for many municipal jobs.



Write us for complete information. Armco Drainage & Metal Products, Inc., 5286 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: Write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO
Steel Buildings



Allis-Chalmers HD-16 crawler tractor and 315 pull scraper

Teamed to increase output ...keep jobs on the move

Here's more of everything you want in a tractor-scraper team . . . a combination of advanced basic design features that cut cost and time per yard.

The HD-16 has an all-steel box-A main frame that absorbs shocks and protects the power train. A powerful Allis-Chalmers diesel engine and your choice of either torque converter or standard transmission drive, give you plenty of work power for big jobs. And with 1,000-hour lubrication intervals for truck wheels, idlers and support rollers, even under severe conditions, you can eliminate daily greasing . . . convert maintenance time into production time.

With its wide, low bowl and offset cutting edge, the 315 scraper makes effective use of the HD-16's power to get heaping, void-free loads. Wheels are inside the cutting edge for smooth loading . . . and loaded weight is equally distributed on all four wheels for fast hauling, long tire life.

This earth-moving team can give you big output plus real dependability. Let your Allis-Chalmers construction machinery dealer show it to you now.

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ALLIS-CHALMERS

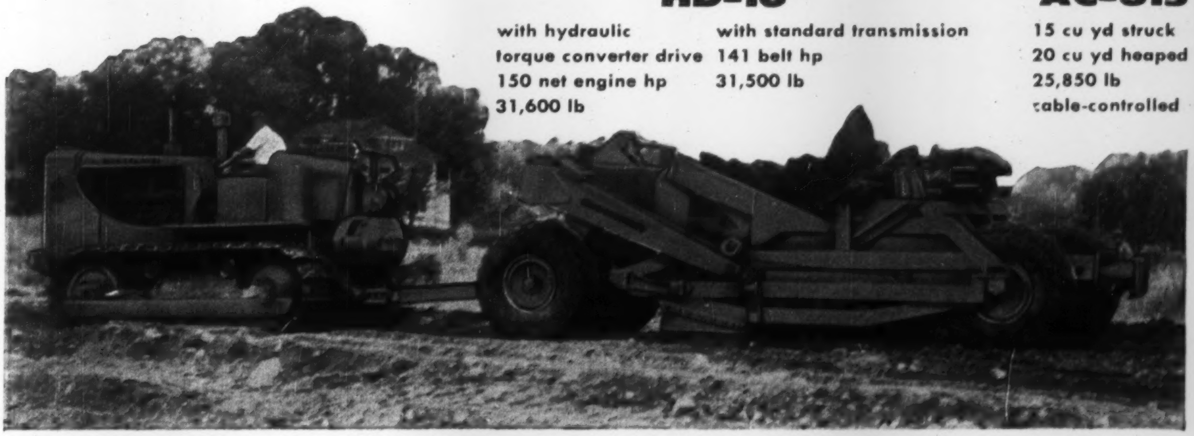
HD-16

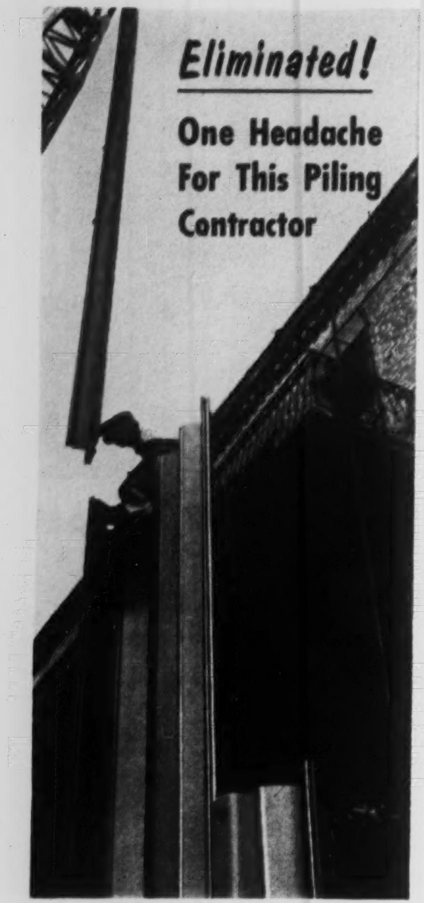
with hydraulic torque converter drive
150 net engine hp
31,600 lb

with standard transmission
141 belt hp
31,500 lb

AC-315

15 cu yd struck
20 cu yd heaped
25,850 lb
cable-controlled





Eliminated!

One Headache For This Piling Contractor

Driving steel-sheet piling through silty material softened by heavy rains—he had to work in a narrow, twisting, busy street with no space for job-site storage, and as always, a heavy cost penalty for time lost. By renting his piling from L. B. Foster Co., he got deliveries *as needed*—delivered by Foster trucks over planned routes. All the headaches that could have been the contractor's were eliminated by using Foster's Piling Rental Plan.

Foster Piling Rental Plans are complete—for all types of steel-sheet piling (and lightweight piling). You get the right type, the exact section, the exact length . . . when you need it . . . and at low fixed cost. Ask your nearest Foster office for details and prices—see for yourself the savings in Foster's Piling Rental Plan.

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EIGHTY-SECOND YEAR OF PUBLICATION

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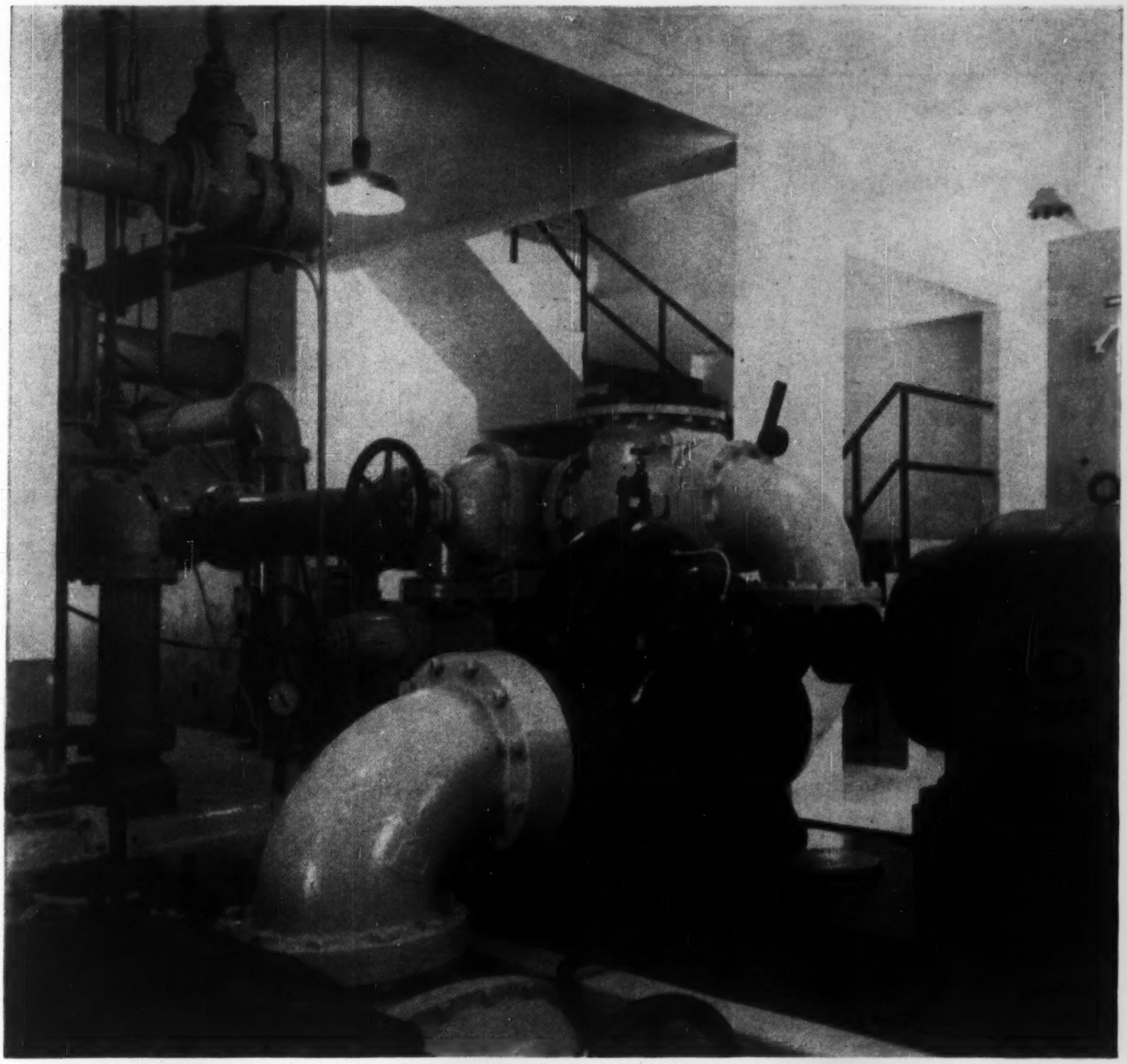

F-M backwash pump in the St. Charles filtration plant. Consulting Engineers: Barnard & Burke, Baton Rouge, La.

Rain barrel retired

A short four years ago, one district of the Louisiana Parish of St. Charles was taking its drinking water from cisterns. Now St. Charles has a million-dollar filtration plant with nine Fairbanks-Morse pumps on duty to serve the 1800 customers so far connected.

In every size community—large or small—there are Fairbanks-Morse pumps on the vital arteries of water supply and sewage disposal.

If your municipal system is straining under the load of a growing population, Fairbanks-Morse will welcome the opportunity to draw on this wealth of experience and work with your consulting engineer to recommend an efficient expansion of your facilities. Fairbanks, Morse & Co., Dept. ENR-67, 600 So. Michigan Ave., Chicago 5, Ill.

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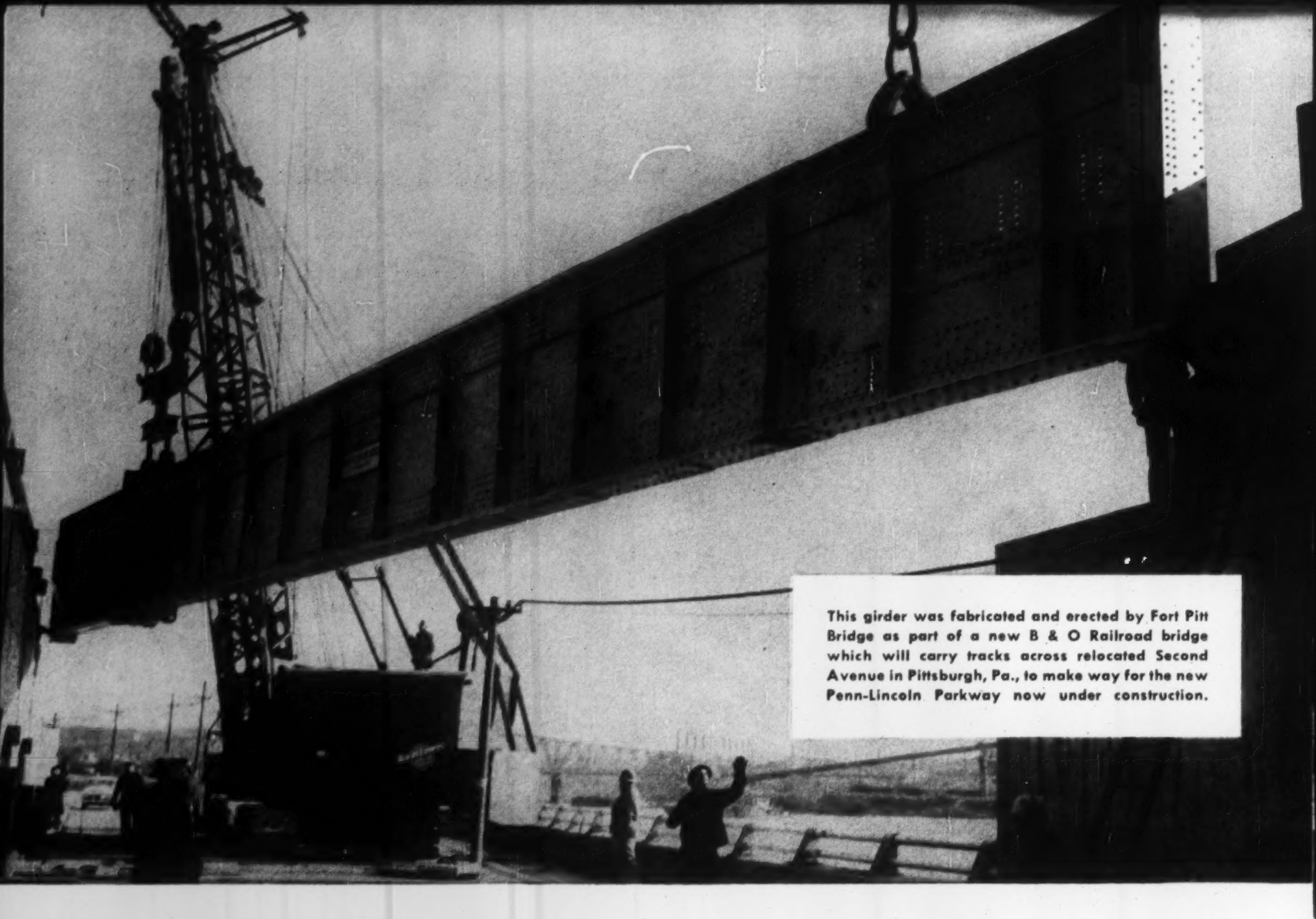

This girder was fabricated and erected by Fort Pitt Bridge as part of a new B & O Railroad bridge which will carry tracks across relocated Second Avenue in Pittsburgh, Pa., to make way for the new Penn-Lincoln Parkway now under construction.

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One of the longest girders ever fabricated by Fort Pitt Bridge. It is 170 feet long,—one of several now being fabricated in our shops for the new Robert Craig Memorial Bridge in Toledo, Ohio.

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With self-draining compressor...

BLUE BRUTE rotary

Eliminates blade damage due to sludge,

REMEMBER THESE?

You don't have to worry about broken or damaged blades due to hydraulic jam, sludge, or frozen condensate with Worthington's Blue Brute rotary.

BLUE BRUTE SIZES: 125′, 210′, 315′ AND 600′

bans blade damage!

frozen condensate or hydraulic lock

A big headache in portable rotary compressors can be trapped oil and condensate that accumulate in cylinder low spots during shutdown.

This trapped oil damages rotor blades on starts—particularly in cold weather.

Worthington engineers designed this headache right out of existence in the Blue Brute rotary. A unique double-deck arrangement of first- and second-stage cylinders, together with the location of the suction and discharge, does away with low spots in the cylinders.

Result: full gravity drainage of all oil from the cylinders and interstage chamber on shutdown. No hydraulic jam can form to damage blades on starts. What's more, no sludge deposits or gummy residues can settle out of oil on working parts to impair performance.

And the self-draining compressor design is only *one* of the features that make for the Blue Brute rotary's outstanding performance.

Clutch for easy starting

Take the Blue Brute's clutch. You never have to worry about cold-weather starts, because this heavy-duty, disc-type clutch lets you start and warm up the engine *without* engaging the compressor. *And you preheat the compressor oil at the same time.*

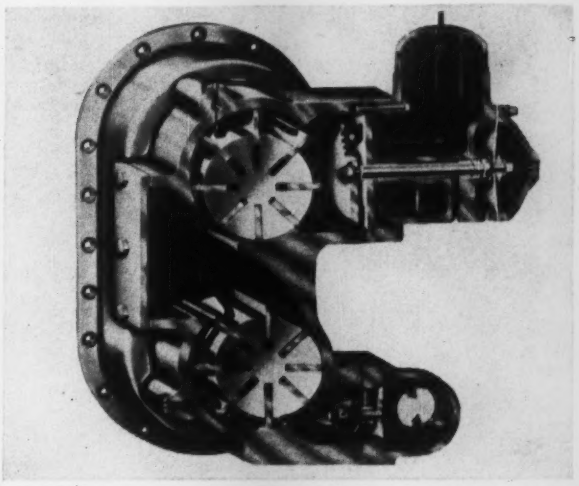
Warm water from the engine water jacket circulates through heating coils in the compressor oil reservoir to preheat the compressor oil. Engine water is automatically shut off when the compressor is placed in operation.

The Blue Brute's rugged, hydraulically operated clutch also acts as a "safety coupling" between the engine and compressor. And, in addition, it automatically compensates for any minor misalignment if it occurs.

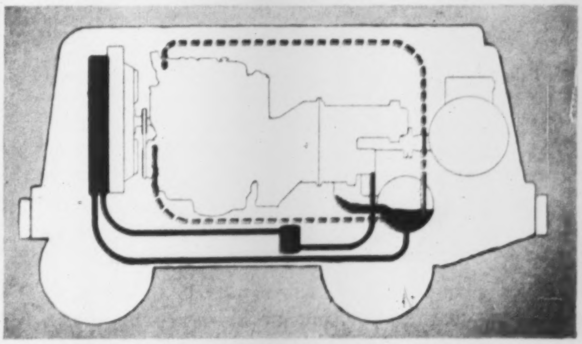
Complete Blue Brute line available

Get all the facts about the Blue Brute rotary compressor from your Blue Brute Distributor. Better yet—ask him to arrange a demonstration for you. There's a Blue Brute for every need—125′, 210′, 315′ and 600′ sizes on all standard mountings. You'll see why we say the Blue Brute rotary is the most flexible portable compressor on the market.

See your Blue Brute Distributor today! Or write Worthington Corporation, Section H.6.4, Harrison, N. J. H.6.4.



DOUBLE-DECK CYLINDER ARRANGEMENT allows full gravity oil drainage after shutdown. Arrows show air and oil flow. Old style, non-self-draining design *(not shown)* with in line cylinders, often trapped oil and condensate in cylinder low spots, often damaging blades on starts.



HOT WATER *(broken blue line)* from engine jacket passes through coils in oil reservoir to preheat oil *(solid blue line)* before clutch is engaged.

WORTHINGTON

IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

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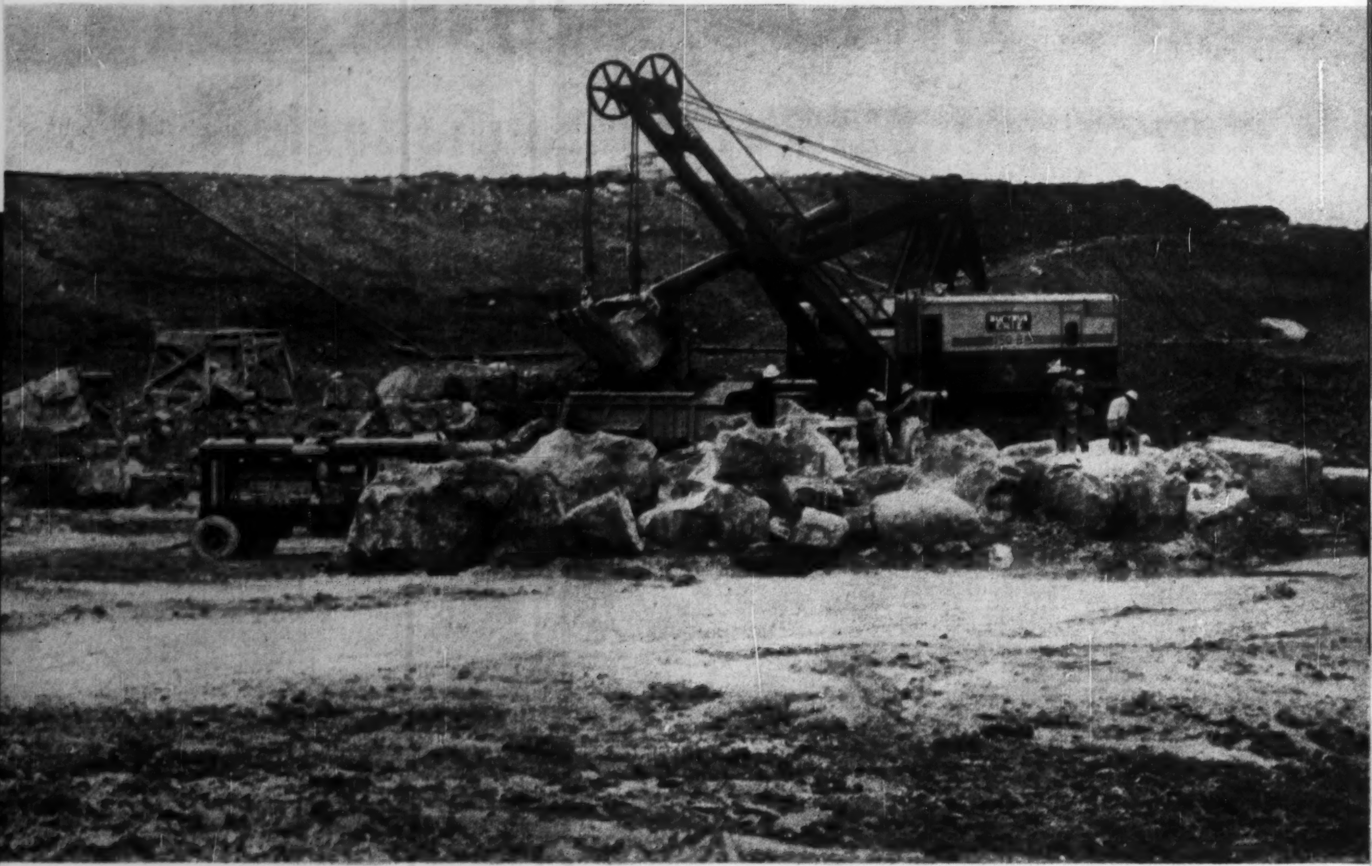
On the St. Lawrence Seaway... and the World Over

Bucyrus-Eries Prove that Good Equipment DOES Make a Difference



One of two Bucyrus-Erie 150-B 6-yd. shovels responsible for much of the 2.7 million cubic yards of excavation for the Iroquois control dam. This $14-million structure will maintain the levels of Lake Ontario.

On the St. Lawrence Power and Seaway projects some extremely tough digging conditions have been encountered — glacial till with the density of concrete, sticky blue marine clay, and heavy boulders. In the thick of this rough going Bucyrus-Erie Ward Leonard electric shovels are handling big yardages, week after week, month after month — proving that good equipment *does* make a difference.

The extra margin of quality that makes these machines standouts on tough jobs gives you better performance in any digging. Their smooth-acting Ward Leonard electric control provides extra fast acceleration and deceleration to speed work cycles. Superior front-end design furnishes plenty of strength while reducing deadweight. And heavy-duty construction holds down maintenance costs as it lengthens machine life.

Bucyrus-Erie Ward Leonard electric shovels can make a difference on your jobs, too. We will be glad to provide complete information.

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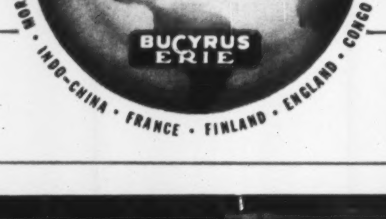
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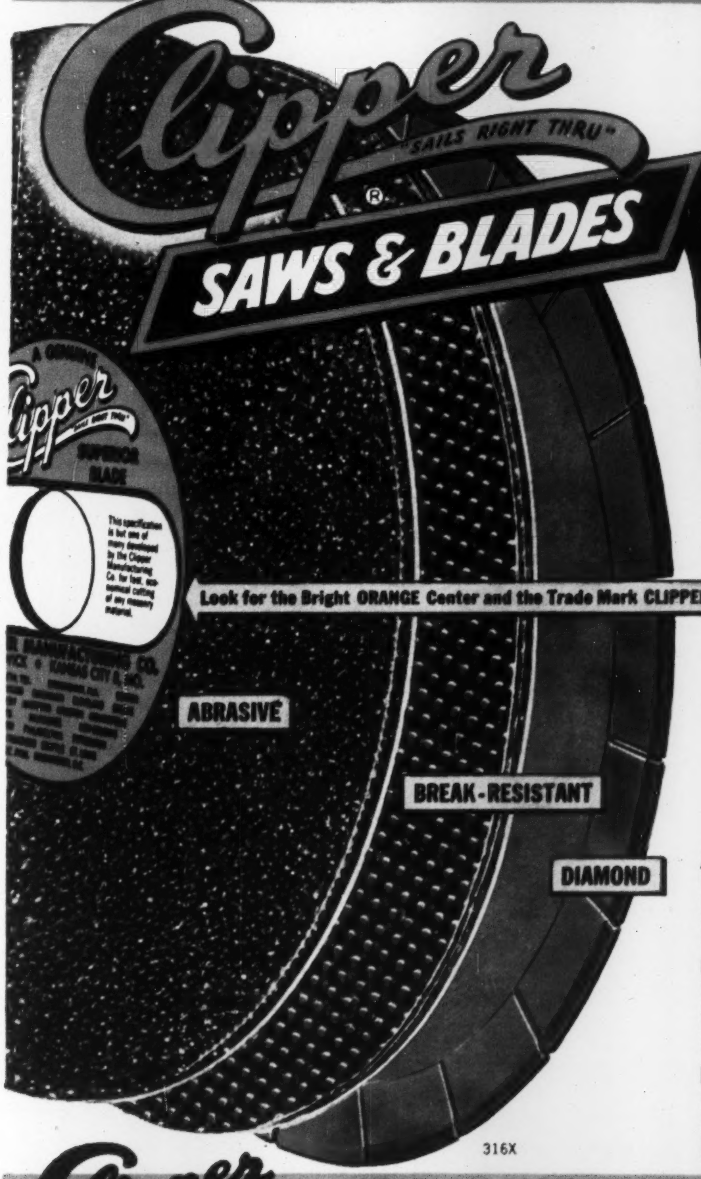
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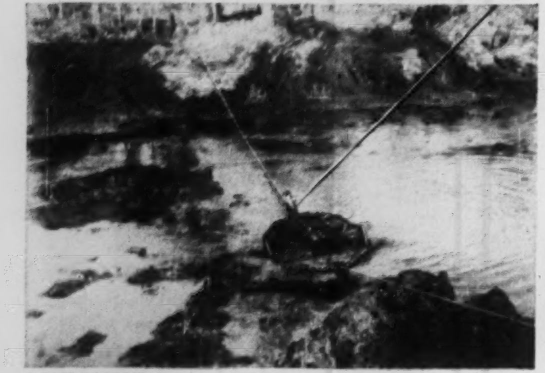
Got A Tough Digging Job?



● SOFT GROUND

● DEEP WATER

● NARROW SPACE

● STEEP HILLS

Use A Sauerman DragScraper

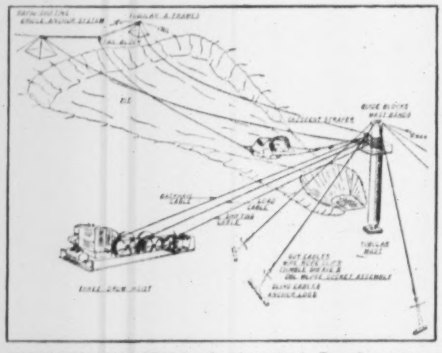
● SOFT GROUND—Sauerman DragScrapers work on surfaces where wheeled equipment cannot go and where mats are required to operate a dragline. The DragScraper digs and hauls its load quickly at ground level to hopper or pile. It carries a payload of two to three times its weight. You are not paying the power costs of a heavy machine with a handling capacity that is just a small portion of its weight.

● NARROW SPACE—A DragScraper can be operated through an opening no larger than the bucket's width. They are used successfully in culverts, sewers, tunnels, under bridges and buildings. Locations with limited space and head room . . . unworkable with other equipment . . . are handled efficiently and economically with a DragScraper.

● DEEP WATER—A Sauerman DragScraper will dig as much as 100 ft. below water . . . this is far below the safe depth that a dragline bucket can go without the danger of undermining and overturning the machine. Use a DragScraper for trenching, digging channels, lakes or for beach construction.

● STEEP HILLS—These are routine for a DragScraper. Material can be taken from anywhere on the bank. Digging from the top of the slope eliminates cave-ins—and the DragScraper gives an extra bonus by pushing additional material in front of the bucket on its way down the slope.

The Sauerman DragScraper operator and hoist is always located away from any hazardous area. It is designed for years of safe, continuous duty, handling bucket sizes up to 15-cu. yds. over spans to 1000 ft. or more.



THE SAUERMAN METHOD—*showing a basic DragScraper installation. Variations of this method are Sauerman engineered to handle the toughest digging jobs at the lowest cost per cu. yd.*

When you have a "tough-to-handle" job consult Sauerman engineers about Sauerman equipment and the Sauerman Method. Request Catalog A, also the Sauerman News and field reports.

SAUERMAN BROS., INC. 632 SO. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers • Slackline and Toutline Cableways • Durolite Blocks

Reader Comment

Nothing Is New

Sir—Your editorial concerning road crowns (ENR May 17, 1956, p. 200), particularly the reflection that from time immemorial, center crowning of pavements has been a time-proven practice, has reached an interesting observation.

Before World War II, while employed on the Panama Canal, I found frequent opportunities to visit the ruins of the City of Old Panama. It was always interesting to note the drainage gutter down the center of each street still clearly discernable despite the fact that this city had been destroyed by the Pirate Morgan in 1671.

L. W. Belland
Chief, Engineering Division
VA Hospital
Iron Mountain, Mich.

Where to Find Blast Data

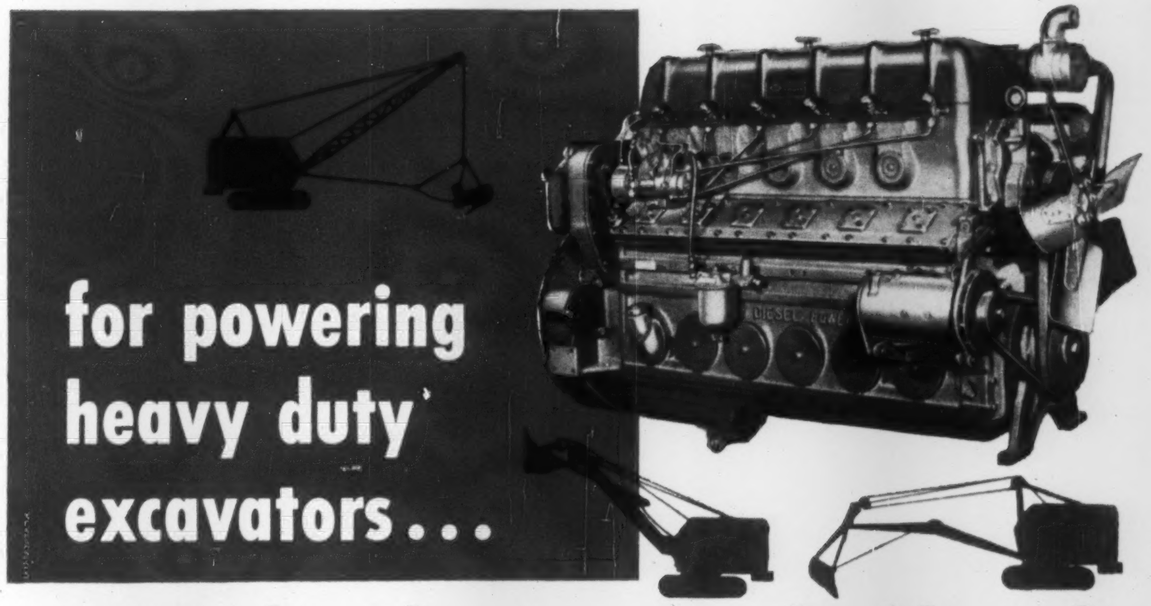
Sir—Prof. Charles F. Peck in his letter in ENR May 17, p. 8, expresses concern over the lack of information concerning blast-resistant design. His charges are certainly correct that a great deal of "hush-hush" surrounds much of the data concerning "heavy" blasts. Unfortunately, this secrecy is needed to maintain the security of our country.

There are available, however, a number of unclassified papers relating to this subject. Probably the most complete collection of basic data concerning the blast, thermal and nuclear radiation from atomic weapons is contained in "The Effects of Atomic Weapons," Los Alamos Scientific Laboratory, Sept., 1950. This text is now being revised. Other papers directly related to problems of blast-resistant construction include:

1. Windowless Structures—A Study in Blast-Resistant Design, Federal Civil Defense Administration, TM-5-4, June, 1952.
2. An Engineering Approach to Blast-Resistant Design, N. M. Newmark, Proceedings, American Society

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.



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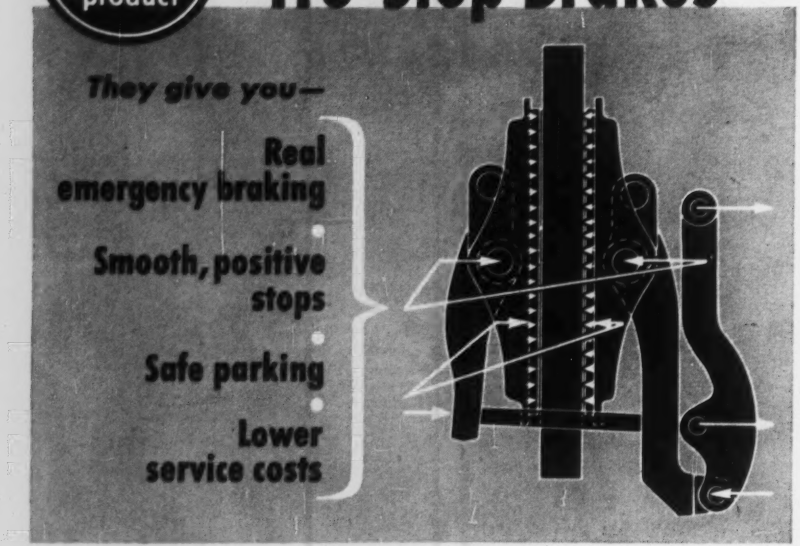

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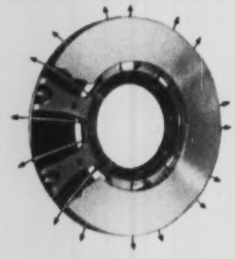

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of Civil Engineers, Vol. 79, Separate No. 306, Oct., 1953.

3. A Simple Method for Evaluating Blast Effects on Buildings, Armour Research Foundation, July, 1954.

4. Design of Blast-Resistant Construction for Atomic Explosions, Whitney, C. S., et al, JOURNAL, American Concrete Institute, Vol. 26, No. 7, March, 1955.

5. Blast-Resistant Building Frames, Johnson, B.G. and Mathews, A., PROCEEDINGS, ASCE, Vol. 81, Sep. No. 695, May, 1955.

R. W. SAUER
Supervisor
Mechanical Engineering Research
Armour Research Foundation
Chicago, Ill.

Older Tunnels

SIR—In ENR Apr. 19, p. 59, two statements are made regarding underwater tunnels which, perhaps, indicate a gap in your historical files.

Regarding prefabricated tunnels sunk in place: ". . . such tunnels have been built at least since 1925." Also: ". . . to carry four lanes of traffic—something no other such tunnel (except in Holland) has ever been built to do."

Your attention is directed to the tunnel in New York City, by which the Lexington Avenue subway passes under the Harlem River. This was a sunk-in-place tunnel and contains four railroad tracks. The line opened in 1918; construction dates would be around 1916 or 1917. This tunnel is described in several contemporary engineering magazines.

It is my recollection, although at the moment I have not been able to verify it, that the two-track tunnel at 149th St. and the Harlem River, for the Lenox Ave. subway, was also a sunk-in-place tunnel. This line opened in 1905.

JAMES WILSON
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Jamaica, N. Y.

CALENDAR

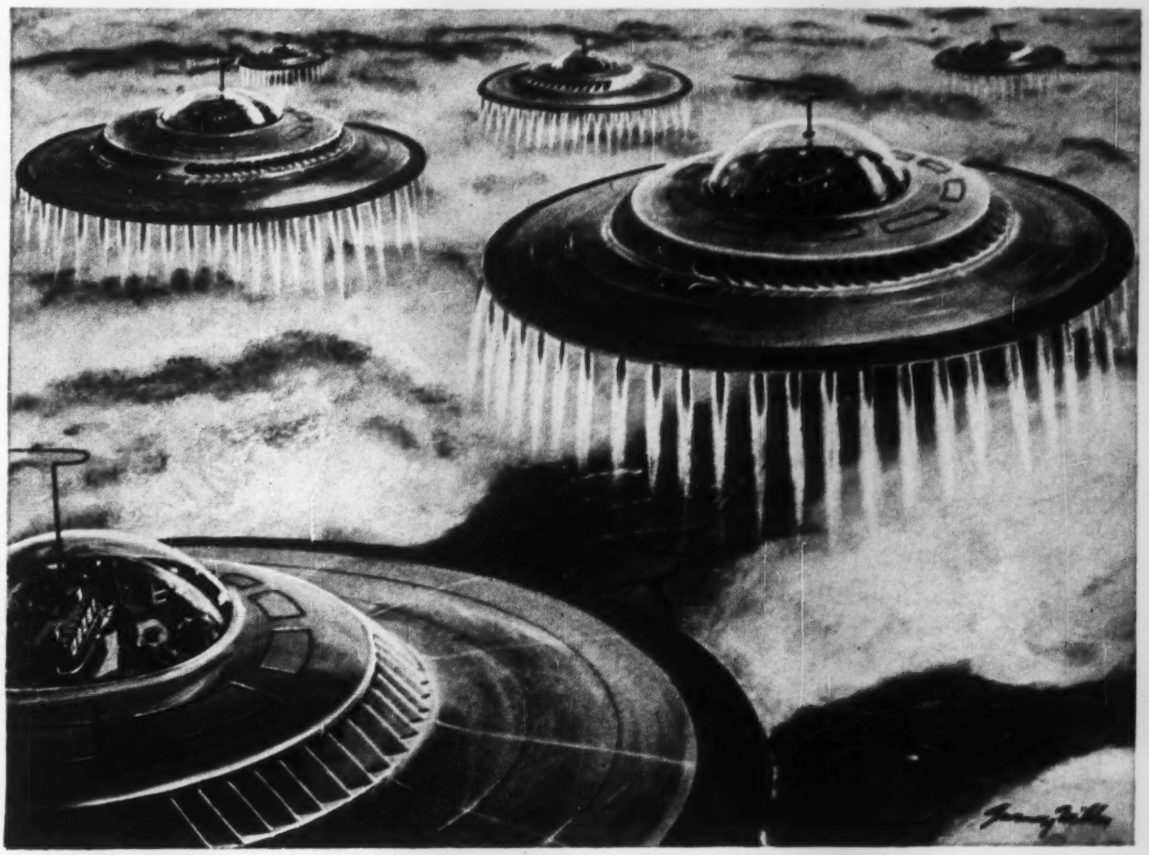
American Society of Civil Engineers, spring convention, University of Tennessee, Knoxville, Tenn., June 4-8.

Materials Handling Exposition, Cleveland, Ohio, June 5-8.

World Conference on Earthquake Engineering, University of California, Berkeley, June 12-16.

American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., June 17-22.

American Society of Landscape Architects, 57th annual meeting, Cleveland Hotel, Cleveland, Ohio, June 24-27.



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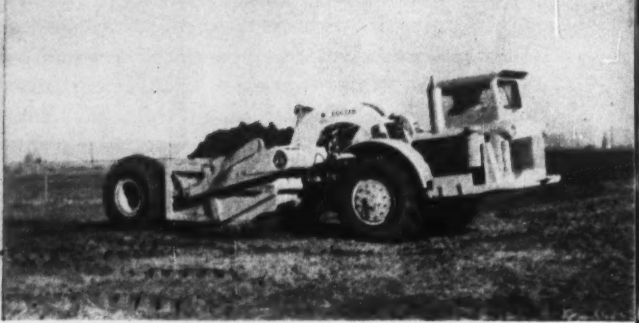
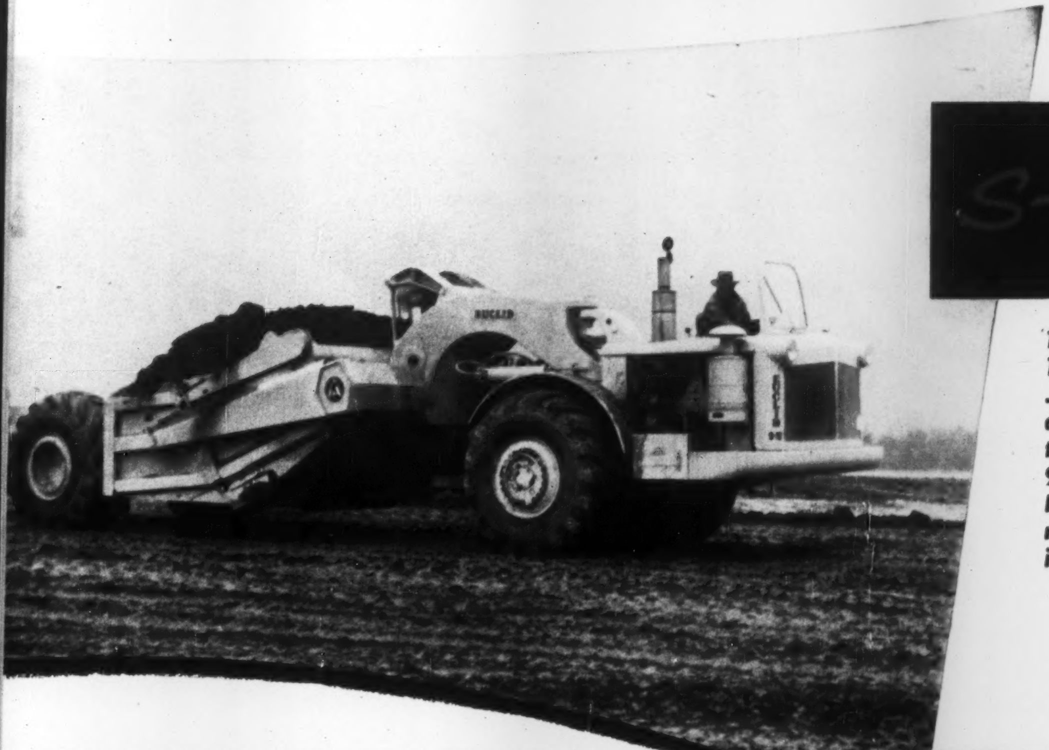
Easy maneuverability of the S-7 makes it a versatile earth-mover for a wide range of work. Full hydraulic steering permits non-stop turns in only 28 feet . . . enables the unit to get in and out of close quarters. Here a load of topsoil is being spread at a New Jersey housing project.



With its low, wide bowl and adjustable 4-section cutting blade, the S-7 is a fast, easy loader . . . picks up heaped loads without pusher assistance in good materials. This "Euc", equipped with cab, is working on a big land leveling project in the state of Washington.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

S-7 and S-12
"EUC" Scrapers



S-12

12 yds. struck . . . 14 yds. at 3:1 slope . . . 16 yds. heaped at 1:1 . . . 26.5 x 25 tires . . . 218 h.p. . . . 9′ 6″ width of cut . . . NoSpin differential non-stop 180° turn in 31 ft.

Big 26.5 x 25 tires, NoSpin differential, Euclid planetary drive axle and 218 h.p. engine give the S-12 plenty of power and traction to pick up heaped loads in a hurry. On this Tennessee highway job, the 28 mph top speed with capacity payloads was a big factor in maintaining high production at low cost.

Contractor preference for "Euc" Scrapers results from pay-off performance on the job.

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ENGINEERING NEWS-RECORD
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CONTENTS

NATIONAL AFFAIRS

Plastics Move Into Construction in a Big Way....... 23
Road Bill Allocations Start July 1.......... 26
More Expressway for Detroit 27
Speed-up May Be Result of New York City's Redevelopment Skirmish 28
Who Will Build the A-Plants?................... 29
A New Secretary of Interior Steps In.............. 29
Runway Maintenance Is a Complex Task.......... 32
Canada, U.S. May Be Near Accord on Columbia River 34
New Tack to Be Tried for Continental Divide Tunnel 34
State Aids Industry to Acquire Treatment Sites...... 36
Extra-Big Bars Make Concreting Easy.............. 36

FEATURES

ENR Conference on Federal Aid for Sewage Works.. 40
Asphalt Lines California Reservoirs................ 50
Shear Keys Were Found Unnecessary............ 61
Salt Lake Trestle: Out, Back in 7 Days............ 67
Precast Concrete Sandwich Panels Turn to Color... 68

NEW PRODUCTS

IH Bids for Bigger Share........................ 75
Square Tubular Crane Booms.................... 76
Vibrating Screed Adapted to Deck Work.......... 76
Tar Kettle Comes With Spray Attachment........ 78
Barrel Tires Roll Over Rough Ground.............. 78
Cold Galvanizing Compound Can Be Brushed, Sprayed on 81
Publications 86

INTERNATIONAL

For Brazil: The Tallest Concrete Building.......... 93
World Bank Loan for Burma Improvements......... 94
Underwater Tunnel for Argentina................. 95

RESEARCH

Analyzing Detergents in Water, Sewage Plants.....100

FIELD AND OFFICE

"Snake Stripe" Goes on by Machine...............103
Gradall Goes Underground........................104

MEN AND JOBS

Maryland Port Authority Is Staffed...............117
NSPE Functional Group Gets Chairman............117
Assistant Director Appointed for USGS............117

BUSINESS AND FINANCE

May Awards Nearly Match 1955 Record...........156
ENR Cost Indexes Hit New Highs..................159
Slow Freight Out...................................159
Wherry Act Projects Subject to Local Taxes.......160

LABOR

Baltimore's Effort to Adopt the Chicago Plan.......163

Reader Comment 10
Calendar 14
Washington Observer .. 21
Books 98
Legal 109
Obituaries 112
Unit Prices 122
Materials Prices 124
Construction Reports ..129
Construction Scoreboard.154
Activity This Week....154
Editorials 180

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THE CONSTRUCTION WEEK

SETBACK ON STRUCTURAL STEEL—Hopes that added capacity would improve structural steel deliveries by July are dimming. Bethlehem Steel Co. has encountered snags that will delay full operation of plant expansion at Bethlehem, Pa. And two wildcat strikes in recent months have cost Bethlehem about 55,000 tons of ingots.

Steel fabricators, meanwhile, continue to be flooded with new bookings. In April, bookings reached 378,947 tons, second largest in the postwar period. April shipments, however, declined to 289,616 tons from a March record. For the first four months of this year, bookings are up 44% over the same period of '55 to nearly 1,481,347 tons. This compares to shipments of 1,133,254 tons, which are 25% over the figure for '55.

HIGHER TURNPIKE PRICE TAG—Approval has been given for issuance of an additional $47 million in bonds to cope with rising costs—land acquisition, materials and labor—in building the 129-mile cross-state Connecticut Turnpike, which had an original cost estimate of $338 million. Passenger car tolls, which had been set provisionally for 15 cents at each of the turnpike's eight gates, will be 25 cents.

FALSE START AT CANNONSVILLE—Officials of New York City's Board of Water Supply were not quite sure last week how they would proceed after failing to receive any bids on May 22 for the first work at Cannonsville Dam, proposed $140-million third-stage development on the Delaware River. The work was to have included an exploratory shaft and several access roads and bridges, unofficially estimated at about $1 million. BWS either may separate the shaft work and the road construction or simply readvertise the current specifications on the possibility that contractor reluctance to bid stemmed from an unstabilized wage situation. (Many trades came up for wage increases on June 1.)

SEPTIC TANKS CAN HANDLE LAUNDRY WASTE—Thirteen of 15 members of a Building Research Advisory Board special committee have concurred in a conclusion that one septic tank can effectively dispose of both household sewage and laundry machine wastes. A 24-page report backing up this finding has just been transmitted by BRAB to the Federal Housing Administration which had requested the study to resolve the differing opinions of many local health departments. Not covered in the study is the effect of laundry wastes—or more particularly detergents—on subsurface drainage systems that go with the septic tanks.

37° uphill dozing...all in a day's work

——for the high-stepping OLIVER OC-18!

There's more here than meets the eye! Shoving tons of earth and rock up steep inclines is just part of the story for this Oliver OC-18.

What makes it even harder is that it's working in loose material—rock, slate, limestone, shale—to grade a spoil pile out of the way of a power shovel working below. You can be sure the unobstructed, *extra* high clearance of the Oliver OC-18 is mighty important in conditions like these. No bogging down or work interruptions—this tractor rides *over* even the softest ground.

Another advantage for heavy work is the OC-18's high-efficiency 161 h.p. diesel with its exceptionally wide torque range. Lugging power actually steps up as the engine slows under loads.

Add Oliver's exclusive Power-Turn steering which allows you to make spot or gradual turns or even stop *without* declutching—or to make an instant speed change without shifting—and you can see why the OC-18 is getting assigned more and more of the really tough jobs.

Why not get all the details on the advanced OC-18? See how it can set you up for faster work, lower costs on any job. See your Oliver industrial distributor.

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WASHINGTON OBSERVER

Pentagon's construction programs are pushing against spending ceilings. This is part of the fuss and furor among the Army, Navy, and Air Force over which service should get priority on missiles and other new weapons.

The fighting is over a bigger share of a pie that grows slowly. The Air Force, particularly, is after more of the $37-billions, and has recently won a point or two.

There's been a top policy approval for more bases to handle the Strategic Air Command's bombers. The idea—approved by the National Security Council, which has the last say—is to disperse our retaliatory bombers so that we can't be knocked out by a relatively few nuclear bombs delivered in a sneak attack.

Now, the plan is to build smaller SAC bases around the main bases—this gives the necessary dispersal, and holds down costs by eliminating the need for servicing facilities at the new satellite bases.

It's still too early to say just how this will show up in spending. But it is part of the budget-making process now going on in the Pentagon. Financing such a program inside the present $37-billion total would mean sharp cuts for both the Navy and Army, which means a continuation of the sharp interservice knifing.

•

Upper Colorado construction may get off to a faster start next year. A group of senators from the basin states are shooting for a program that would total $11.4 million for the year beginning July 1. This compares with the Administration's budget request of $6.4 million in construction money, which the House cut to $4.4 million.

Glen Canyon Dam would get most of the increase sought. Its share of the Upper Colorado money would hit $9.3 million, compared to the $5.1 million in the Administration request.

The Administration will go along with the bigger spending. Commissioner Dexheimer says he could let a contract for a diversion tunnel at Glen Canyon as early as September under the stepped-up program.

Dexheimer said he could also use $500,000 at the Navajo Dam site for construction next year, although the original budget request was only for $85,000 for planning money.

Changes are against the bigger amounts getting through intact—but the pressure will help offset the House cuts.

•

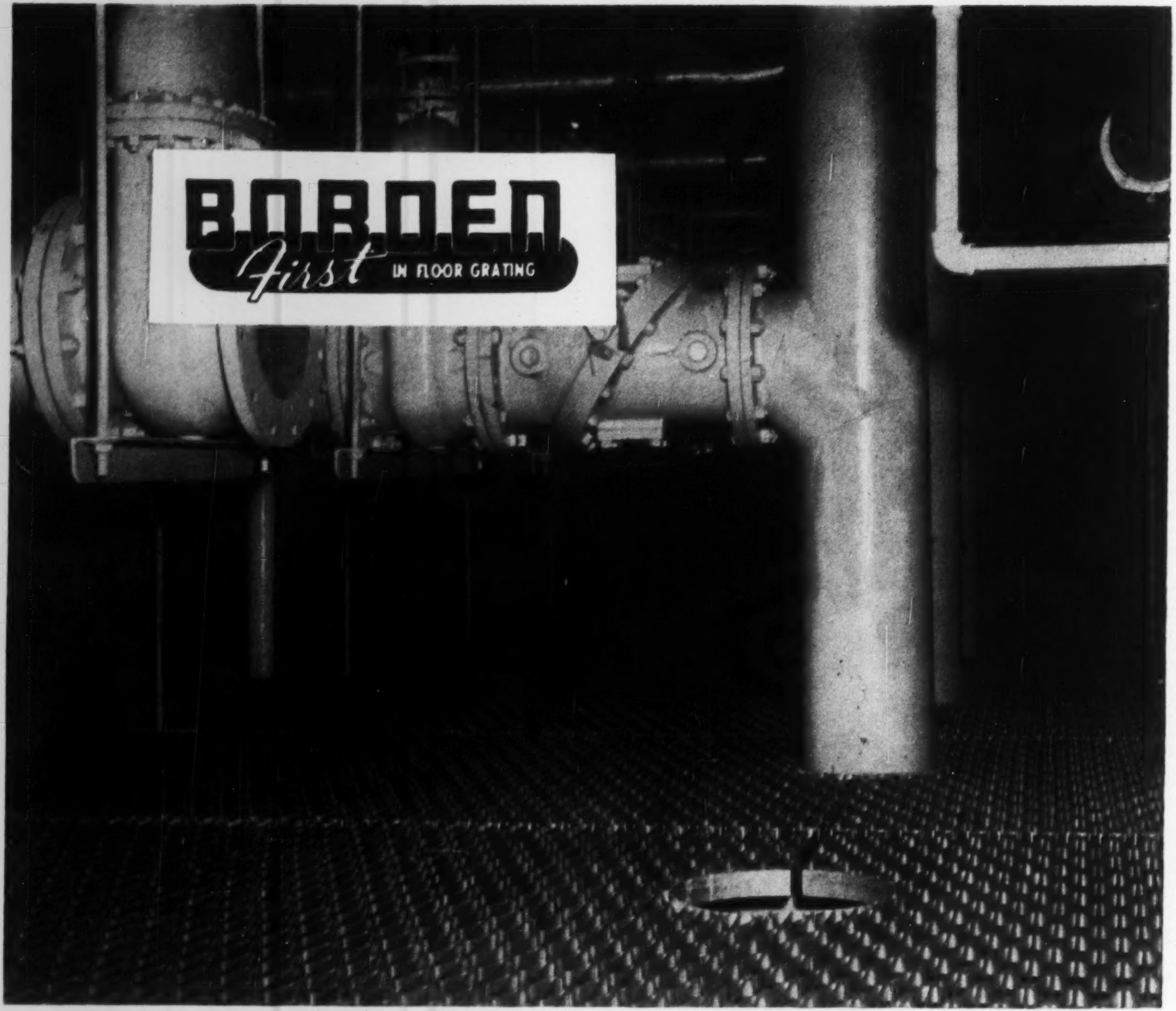
A new market for 10,000 houses will be opened up by the new law to provide housing for essential civilian employees of the military. The program will take care of scientific and technical personnel at bases being built up to take care of guided missiles and other such programs. FHA will insure mortgages for these people now.

There is an immediate shortage at several bases: Redstone Arsenal at Huntsville, Ala.; Naval Ordnance Test Station at China Lake, Calif.; Patrick Air Force Base, Cocoa, Fla. Other spots where housing will be needed include Holloman Air Force Base in New Mexico; Mojave Marine Corps Air Station in California; and the Seneca Ordnance Depot in New York.

•

You can count on extension of GI housing benefits for at least another year. That's the conclusion most observers draw from the Senate's approval of a new omnibus housing bill—on which the House is still holding hearings.

Special provision for building housing for the aged also seem to be sure-fire. The Senate bill would provide (1) 15,000 low-rent public housing units to be authorized each year and (2) liberalized mortgage insurance for persons over 60.



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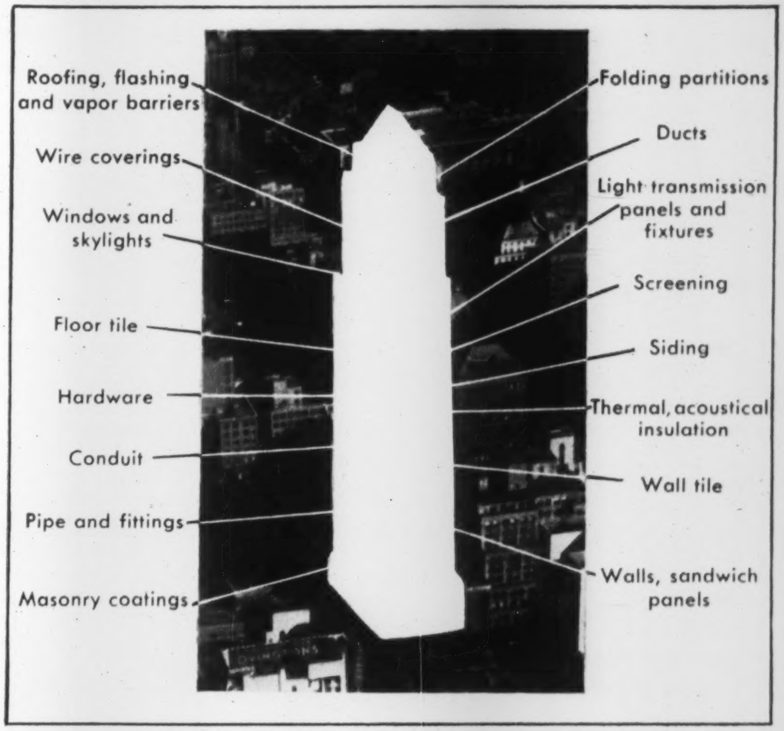
ENGINEERING
NEWS-RECORD
June 7, 1956

Plastics— Moving Into Construction In a Big Way

New uses are being found for these novel materials in a wide range of applications—from foundations to roof—as major components as well as coatings



Frederick S. Merritt
Senior Editor

The Seventh National Plastics Exposition opening next week in New York City's brand new Coliseum will be the largest exhibit of these materials ever held. And the displays will show that plastics manufacturers are ready to invade the construction industry on a broad front.

New products are set to move out of the developmental stage and into mass production. Many have been put to use for the first time within the last year—as curing membranes for concrete pavement, sealers for concrete reservoirs, piping, insulation, coatings, formwork, vapor barriers and adhesives and in a wide variety of applications in buildings, including complete walls, windows and roofs.

The exposition, sponsored by the Society of the Plastics Industry, Inc., will have more than 200 exhibitors. A large percentage of them will display products aimed at the huge construction market.

• **Why pick this target?**—The reason is plain: Plastics producers must find new markets for their rapidly increasing output. Last year, the plastics industry produced 3,600,000,000 lb of raw material—up 30% over 1954—and this year will probably turn out 4,000,000,000 lb. If sales are to keep pace with this production, new outlets for plastics must be found, and construction is an enticing prospect. At present, only about 10% of plastics production is going into construction.

At a conference on plastics sponsored by the Building Research Advisory Board not quite two years ago, R. K. Mueller, vice president and general manager, Plastics Division, Monsanto Chemical Co., threw down the gauntlet: "We must be assured of outlets for our materials, and we are willing to spend for the research and development work necessary to match the requirements of builders and architects." (ENR Nov. 4, 1954, p. 22)

• **What plastics offer**—Since then, plastic products have been wedging their way into construction. They have many appealing characteristics—high strength-weight ratio, immunity to corrosion and rot, light-transmitting qualities, attractive colors and low thermal conductivity.

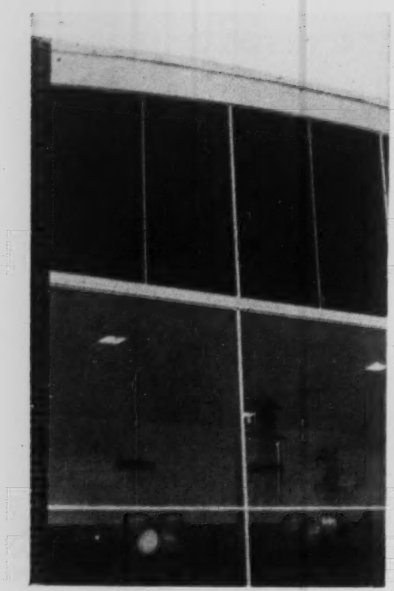
On the other hand, plastics have some properties which require that great care be exercised in selecting the proper material for a given use; caution also is needed in design and installation:

- Plastics creep under constant load or when their temperature rises.
- They have a low modulus of elasticity, which also is time-and-temperature dependent, and therefore may deflect more than ordinary structural materials under load.
- They have a high coefficient of thermal expansion, requiring provision for relatively large changes in length with temperature.
- Strength may vary with direction.
- Durability is uncertain, since most of these materials are too new to have built up a background of experience.
- And practically nothing is known about their resistance to fatigue.

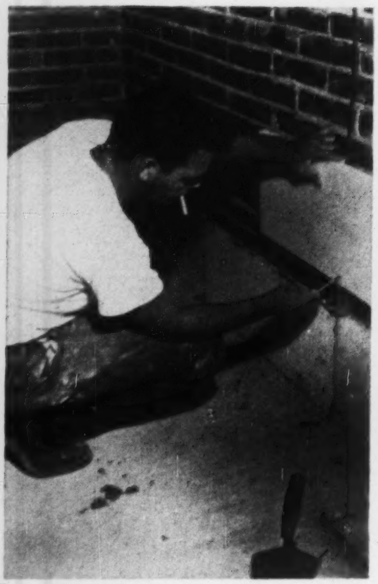
Furthermore, cost may be high. Often, plastics are economical only when they can do a better job than other materials, when they can do something that other materials or combination of materials cannot do or when cost can be reduced by combining plastics with other, less expensive materials.

• **New applications**—At the New York Coliseum exposition next week will be found many examples of these materials that have overcome these handicaps. To mention a few new ones:

1. Wall panels with a phenolic-fiber honeycomb core sandwiched be-

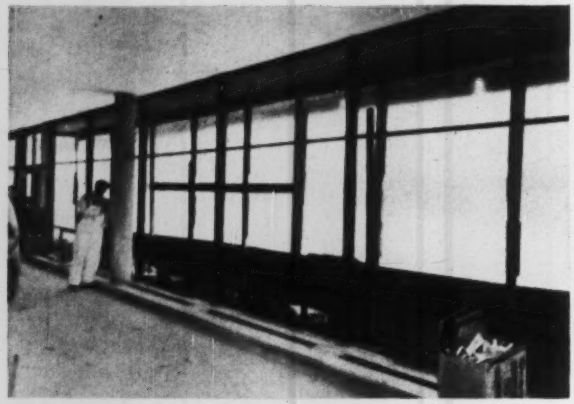


PLASTIC WALL PANELS above windows of Chicago bowling alley have phenolic-fiber honeycomb core sandwiched between glass-fiber reinforced polyester.

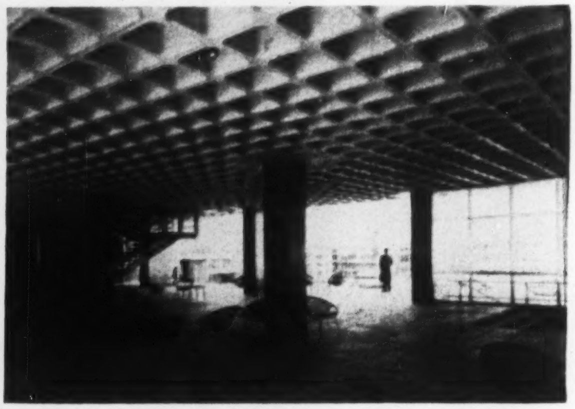


INSULATION made of expanded polystyrene, easily cut away around outlets, is cemented directly to brick wall. Water resistance is high.

VAPOR BARRIER laid on the ground prior to casting a concrete floor is made of vinyl film. Other tough plastics also are available for this use.



ENCLOSURE during construction of a school in Sharon, Conn., was made of prefabricated frames of transparent polyethylene film, permitting mid-winter work in comfort.



WAFFLE CEILING under flat-plate reinforced concrete floors was formed with easily stripped domes made of glass-fiber reinforced plastic.

tween glass-fiber reinforced polyester. Standard faces range from 0.01 in. in thickness to 0.024 in. and cores generally from ¼ in. to 1 in. Weight varies from about ¼ psf for the thinnest combination to ¾ psf for a 1-in. core with 0.024-in. faces. Heat-transmission coefficient, *U*, for the 1-in. standard core is 0.35 and for a foamed-filled core, 0.23. The degree of transmission depends on the color of the facings.

2. Sandwich wall panels using polyester facings with plywood or expanded polystyrene cores or thin concrete facings with expanded polystyrene core. These also are lightweight, offer excellent insulation.

3. Vapor barriers and curing membranes made of vinyl, polyethylene or oriented polyester. Available in large sheets of low permeability, they are relatively low-cost and easily installed. Styrene foams are being used when a combination moisture barrier and insulating material is desired. It may weigh as little as 1.3 lb per cu ft, the insulating value depending on density of the material.

4. Wallboards of striated styrene. Applied in thin sheets, this material is tough and durable for indoor applications.

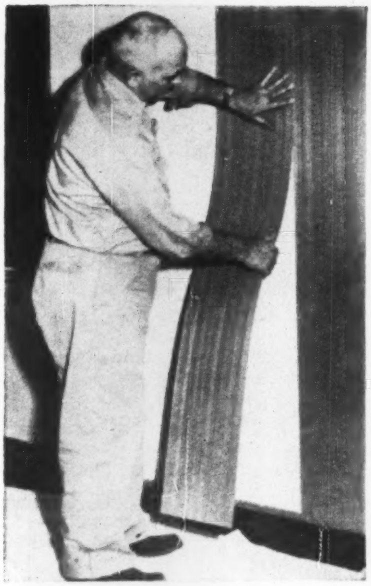
5. Dome and pan forms composed of glass-fiber reinforced polyester. These lightweight forms can be reused many times.

6. Sprayed on roofing of mineral-filled vinyl, neoprene latex and mineral-filled acrylic coating. Particularly suitable for curved roofs, they are easily applied.

7. Siding and roofing of glass-fiber reinforced polyester or acrylic sheet. Lightweight, these materials are available in color and transparent or translucent. They also may be used for glazing windows and skylights and for partitions. As windows, they may eliminate all ultra-violet rays from sunlight, whereas ordinary glass transmits about 70% of these rays.

8. Electrical insulation. Radiant heating, for example, is being accomplished with plastic-insulated wire embedded in plaster ceilings.

9. Artificial lighting of building interiors. Thin translucent plastic sheets are being widely used both in lighting fixtures and luminous ceilings



WALLBOARD made of striated styrene sheets is cemented in place, forming a tough, durable, easily cleaned finished surface.

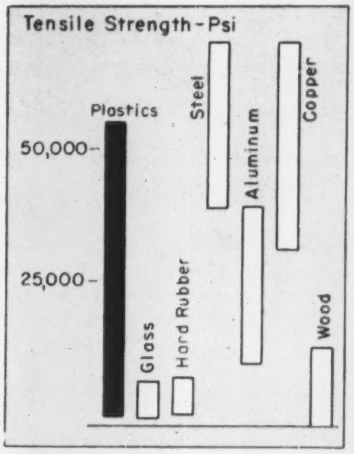
WINDOWS made of glass-fiber reinforced polyester are shock-resistant, filter out ultra-violet sunlight.

as light diffusers. In some cases, sprinklers are placed above the plastic in luminous ceilings and are thus hidden from view, the theory being that a fire would melt the plastic and thus give the sprinklers full play.

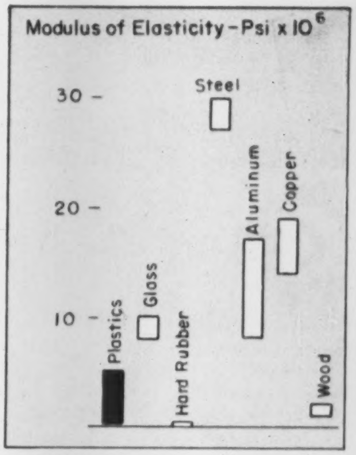
10. Ducts and piping. Resistance to corrosion, rot and the attack of many types of chemicals make some plastics highly suitable for this use.

11. Calking. Several plastics have been developed with properties particularly suitable for this purpose—and especially with the ability to retain these properties after long exposure to weather. They are finding wide application for glazing and calking metal wall panels.

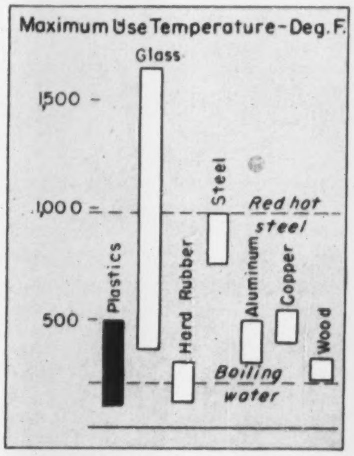
Here's how plastics stack up . . .



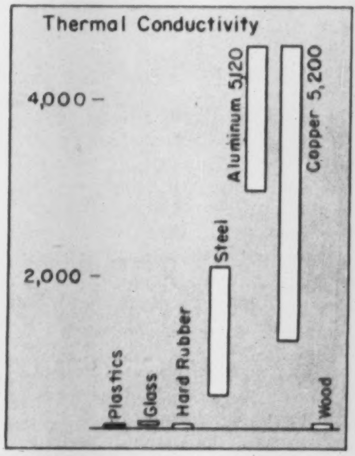
TENSILE STRENGTHS go into steel range.



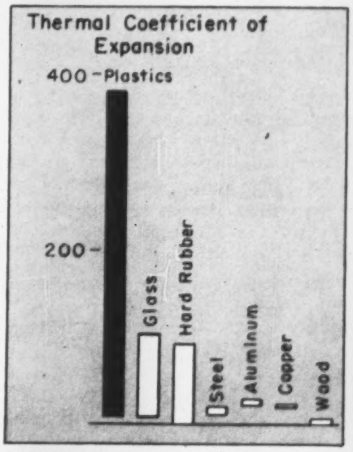
RIGIDITY is small — like wood.



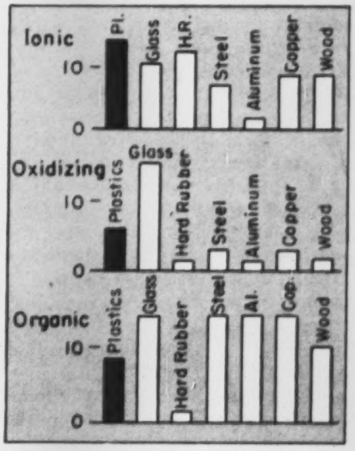
STABILITY under heat may be poor.



INSULATION value, however, is good.



EXPANSION COEFFICIENT may be excessive.



CHEMICAL RESISTANCE is favorable.

data. Monsanto Chemical Co.

With favorable action by Congress assured . . .

Road Bill Allocations Start July 1

With the federal highway bill on the last lap of Congressional action, state highway departments were assured this week that they would know by July 1 how much federal money they will have to work with over the next two fiscal years.

Some $3 billion in federal aid funds –including that which is due under existing legislation–will be committed to the states during the 12 months beginning July 1. The federal commitment will increase to $3.5 billion for the following fiscal year.

Settling on a formula for allocation of funds to the states was the main task of House-Senate conferees at work this week ironing out divergencies in the two versions of the highway bill. Prompt approval of their work by both Houses was assured.

• BPR Figuring Now

But, even before the bill reaches the President for his signature, the Bureau of Public Roads will be figuring the individual states share of funds under whatever allocation formula emerges from conference this week.

These allocations of highway funds by the Commerce Department will more than double the present federal-aid program, which stepped up a year ago to an authorized level of about $1.65 billion a year–the highest in history.

Spending of authorized and allocated funds, of course, lags somewhat behind the actual allotments.

Like previous federal-aid highway legislation, the new law will provide that states can claim the federal money in payment for new construction at any time within three years after the funds become available.

This lag, or lead time, necessary to convert money into actual construction shows up in the balances already available under the current federal-aid highway program. The states have $500 million of federal money on tap from previous legislation that will account for nearly $1 billion of highway work when it is plowed into definite road construction programs. In addition, they have $1.2 billion of federal-aid projects in the programmed and planned category.

Because of the lead time required, actual spending of the new highway money will step up more gradually than the fund allocations. On the basis of estimates supplied Congress by the Bureau of Public Roads, capital outlay on federal-aid highways may be expected to increase at a rate of about $600 million a year during the early stages of the expanded 13-year program.

Even this rate of growth will mean well over $3 billion a year of construction spending on federal-aid highways three years from now, more than twice the estimate for the current year. More than half the federal-aid expenditure by that time will be on the interstate system, which will take larger and larger amounts each year–up to $2.5 billion out of a construction total of about $4.4 billion in 1966.

Construction outlay on highways and streets that receive no federal aid is expected to average at least $4 billion a year during the life of the new program. Tollroad construction will fall off rather rapidly in the next few years, but in the opinion of highway economists, states and local governments will compensate for this decline with funds from increased highway-user revenues and new bond issues. Overall highway construction spending, therefore, appears slated to rise well over $8 billion a year, at a conservative estimate.

• States Have Planned

Many states and cities have had their sights set on the expanded federal highway program for the last 18 months. Speedup of existing programs will follow quickly upon enactment of the legislation. Maryland, for example, sees a 2 to 3-year gain in completion of costly interstate routes through metropolitan areas (ENR April 19, p. 59). These high-priority sections of the state's current $500-million roadbuilding program had been scheduled for construction as rapidly as money became available, and the big step-up in federal aid will make quick action possible.

Preliminary and even final planning of expressways is well advanced in a number of cities and metropolitan areas. More than half of the $27-billion estimated expenditure for the interstate system is to go into the 2,300 urban miles of the 40,000-mile network.

Where ready to move, urban projects will proceed rapidly. But a large proportion of the work in metropolitan areas has to go through a long process of definitive location, acquisition of property and removal of existing structures before actual building of the new highways can begin.

• Rural Mileage First

Fastest action is expected to come on the rural mileage of the interstate system. Final locations have been approved by the Bureau of Public Roads for about 11,500 miles of the system, more than 90% of it outside metropolitan areas. Terminals of the remaining rural mileage are fixed by these approvals and by the general route locations between centers of population.

Highway departments can start at once to select the best locations for the rural mileage not yet pinned down. In open country, distance and topography are the main considerations in determining the proper balance between construction cost and vehicle operating expense for the traffic that will use the road. With their own forces and the aid of consulting firms, the states can move rapidly by aerial surveys or otherwise to locate the rural routes.

With locations approved, the highway departments can nail down the right-of-way by land acquisition. Most states have highway funds than can be tapped for this purpose. In addition, under both old and new legislation, they can get advances from the federal government to tide them over any periods of shortage.

Design standards for the interstate system are not expected to cause any delay. As soon as the law is passed, the American Association of State Highway Officials will submit to the states for approval criteria worked up by the AASHO Committee on Planning and Design Policy. After approval by 36 of the states, the standards will go to BPR for official acceptance and application throughout the system.

• Method Not Critical

The method of allocating federal funds among the states–main point of difference between the House and Senate versions of the bill–is not critical during the early years of the program. Under either method, the states for the first two or three years will be receiving sufficient federal funds to accelerate their work on the interstate system and on other federal-aid roads. Future Congresses will review the aid programs to correct any imbalances that may show up, for example, in the apportioning of money to complete the interstate system.

A number of the more populous states would get less for their interstate mileage under the Senate formula. In the first two years, for example, the Senate bill would give New Jersey only $60 million of new interstate money instead of $160 million under the House measure. California would receive $157 million instead of $272 million. But other populous states like Pennsylvania and New York would get more, rather than less. Even in the states most severely affected, the amount of interstate aid could finance the early stages of an accelerated program of interstate construction.

Congressmen this week were counting on the House-Senate conferees to work out a compromise that would win approval of both bodies. In any event, the apportionment formula will be subject to revision in later years, as detailed studies are completed of the cost of the interstate system.

Other key provisions of the new legislation:

- An increase of one cent per gallon in the federal tax on gasoline and diesel fuel, stepping up the levy to 3 cents on July 1 from the present 2 cents. In addition, tire excises go up 3 cents to a new rate of 8 cents per lb, and camelback for retreading is taxed for the first time, at 3 cents per lb.
- Trucks using interstate system highways are limited as to axle weight but not as to length or height. The load limits are 18,000 lb for a single axle and 32,000 lb for tandem axles. In addition, trucks with a gross weight in excess of 26,000 lb have to pay an annual registration fee if they operate on the interstate system.
- Federal funds may be used to reimburse public utilities for relocation costs made necessary by highway improvements, in the same proportion that the federal government contributes to the overall cost of the road project.
- Tollroads or free roads completed in recent years to such high standards that they can be incorporated in the interstate system may be eligible for partial reimbursement to the states, based on depreciated investment, if Congress so determines after thorough study.

Tennessee Roads

1956 highway program will set state record

Tennessee's highway building program—reportedly the largest in the state's history—is nearing the $50-million mark.

Since Jan. 1 contracts have been awarded on 220 projects in 88 of the state's 95 counties. And 138 of these now are under construction or have been completed.

One of the most important phases of the Highway Department's program is construction of bridges to replace old narrow structures on heavily traveled roads. To date, contracts for 162 bridges and 1,317 mi of highway have been placed under contract.

Additional awards estimated to total between $6 million and $7 million will be placed under contract on July 18, and more awards are scheduled for summer and fall.

Public Health Service Names Research Advisors

Formation of a 11-member Sanitary Engineering Research Advisory Committee has been announced by Mark D. Hollis, chief engineer, U. S. Public Health Service. The committee, composed primarily of representatives of colleges and universities, has been established to advise on sanitary engineering research activities.

Members of the committee are: Dr. Gaylord W. Anderson, Mayo professor and director, School of Public Health, University of Minnesota; Jess C. Dietz, department of civil engineering, University of Florida; Erman A. Pearson, department of engineering, University of California; George J. Schroepfer, department of sanitary engineering, University of Minnesota; Leslie Silverman, department of industrial hygiene, School of Public Health, Harvard University; Dr. Oram C. Woolpert, executive director, research foundation, Ohio State University; Clarence I. Sterling, Jr., director, division of sanitary engineering, Department of Public Health, Commonwealth of Massachusetts; Kenneth S. Watson, consultant, water management and waste control, plant engineering and maintenance service, General Electric Company; and Lt. Col. Jack Carmichael, chief, engineering branch, Office of the Air Force Surgeon, Headquarters, Air Material Command, U. S. Air Force.

More Expressway

Detroit extension to run under exhibits building

The $14.5-million extension of Detroit's John C. Lodge Expressway has been formally approved by the city's mayor. The super highway extension will swing on to Jefferson St. and dip below the proposed new exhibits building in the Civic Center, (ENR Mar. 29, p. 25) and then up to grade at Griswold St.

Completion of the extension is set for January, 1959. Jefferson St. will be widened to boulevard width of 210 ft with an 80-ft wide center island for pedestrians. The Lodge Expressway is now complete to the Lafayette Bridge and will run in a southeasterly direction in the sweeping curve under Fort St., below the Union Depot tracks and under First St. to Jefferson St. Surface level bridges will be built for vehicular traffic at First and at Wayne Streets for easy access to the convention hall and exhibits building. Woodward Ave. will be widened from Fort St. to Jefferson Ave. Randolph and Wayne Streets will also be widened.

Detroit's Mayor Cobo was the last of Michigan's "big three" in highways to approve the extension. State Highway Commissioner Charles M. Ziegler and Leroy C. Smith, county highway engineer, had already said yes.

Construction costs include the Union Depot and Fort St. bridges, the rebuilding of railroad facilities and a small mail and express building and freight house. The project will be financed by revenue bonds backed by the City of Detroit, Wayne County, the State Highway Department and the federal government. It will be paid for by future gasoline and truck weight tax revenues.

Banks Named for California Water Job

Harvey O. Banks, California's state engineer, has been tapped by Gov. Goodwin Knight to head the state's new Department of Water Resources. And M. J. Shelton is to be his deputy.

This announcement made last week, ended the suspense over who would head the largest non-federal water development project ever planned.

As state engineer, Banks has had a considerable hand in developing California's $11.3-billion plan. And, Mercel Shelton, as general manager and chief engineer of the La Mesa, Lemon Grove and Spring Valley Irrigation District near San Diego, is also an experienced hand at California's water problems.

In making his announcement, Gov. Knight made it clear that a large field of qualified candidates was considered.

Banks' new position will put him in a position to make all final technical decisions on the development of California's grandiose plan (ENR May 17, p. 27).

Speed-up may be the result of . . .

N.Y.'s Redevelopment Skirmish

After a heated skirmish over delays in the city's urban renewal program, the federal government and New York City last week publicly put away their weapons and made some private plans for an armistice.

Although the battle itself was inconclusive, one result may be a speed-up in nearly a half a dozen big Title I projects now in the planning or development stage.

Government officials first called the city to task because some private redevelopers have held sites for four years or more without starting construction.

During that period, one developer used part of a site for a commercial parking lot, while other developers have collected rents for three to four years from the tenements they contracted to raze. These activities are not illegal. But they have been a sore point in the government's dealings with the city.

The problem has not arisen in other cities that have urban renewal programs because New York is the only one that turns both "land and people" over to the redeveloper.

In New York, the builder has the responsibility of relocating the families that live in the slum area. In all other cities, the municipality or a public agency selected by the city, handles tenant relocation.

While these points furnished ammunition for Regional Administrator Walter S. Fried of the Housing and Home Finance Agency, his principal contention was that four projects were in default on their original agreements or soon would be. These agreements had provided that the projects would be completed within four years from the time the builder acquired the site.

But the blame for this turtle pace rests not on the builders but on the government, according to Robert Moses, the chairman of the Mayor's Committee on Slum Clearance.

Moses contends that the real basis for the delays is slow processing of FHA mortgage commitments caused, in part, by different approaches used by two federal agencies, the Urban Renewal Administration and the Federal Housing Administration.

Elaborating on this point, William S. Lebwohl, director of the city's Committee on Slum Clearance, said, "FHA is primarily a financial agency and requires housing sponsors to show they can get returns on their investment to pay off their mortgages, while the Urban Renewal Administration is interested primarily in slum clearance" and writes regulations on room size, open areas and other requirements.

While the Urban Renewal Administration may feel that from a planning standpoint, a certain project could have only 1,000 units on a certain tract, FHA may require 1,200 or 1,400 units on the grounds that more intensive development of the land is required to make it financially feasible, city officials say.

This situation is being corrected, according to Lebwohl, with URA and FHA cross-checking closely so that plans do not have to bounce back and forth from one group to the other—with consequent long delays.

Another spectre present is the ghost of the Sec. 608 windfall scandals. Although some of these projects were authorized in 1952, FHA became gun-shy after the extensive Congressional investigations and did not offer a commitment for any of the four delayed projects until 1955.

North Harlem and Manhattantown have preliminary commitments. The first is an $18-million project, the latter a $32-million redevelopment.

Two others involved in the current controversy, Fort Greene (in Brooklyn) and Harlem have been promised commitments by FHA but have not yet received them. Fort Greene is a $17-million project. The Harlem redevelopment will run about $18 million.

Both the city and the federal government will draw a tighter rein on the builders of these projects than they have in the past.

In the contract redevelopers sign with the city, the builders are committed to complete the project within four years from the date they acquire the land. On that basis, these four projects are either in default now or nearly so.

Extensions have been granted by the city—principally because of the difficulty builders have had in getting FHA commitments, without which they cannot get financing.

As a result of the latest meeting between the HHFA and the city slum clearance officials, builders' requests for further extensions will be reviewed by the federal government. The extensions might be kept short in order to prod the builders.

Two other projects, in which FHA commitments are not involved, drew fire from Moses last week. He warned the developers to show more progress or surrender their contracts.

The two projects under fire were the Washington Square and New York University-Bellevue redevelopments. The former involves housing, a shopping center and expansion of New York University on 17½ acres southeast of Washington Square. The latter is a 9½-acre redevelopment from First to Second Avenue between 30th and 33rd Streets.

State Spending Goal Is Set

Pennsylvania has closed the books on the longest state legislative session in state history after approving a series of measures that will substantially bolster public works construction.

The General State Authority (the state's borrow-and-build agency) was granted permission to sell another $100 million in bonds, raising its financing ceiling to $430 million.

Included in the authority's program are mental hospitals, state teacher college improvements, additions to tuberculosis hospitals, state police barracks, an underground parking garage at the state capitol, state park improvements and other building projects.

The legislature also gave the authority permission to spend $12.5 million in new construction at Pennsylvania State University.

In addition to this, the legislature increased the revenue bond financing capacity of the State Highway and Bridge Authority from $80 million to $120 million—but limited expenditures to matching funds under the new federal highway bill.

State road subsidies to local municipalities were upped from $18 million to $30 million a year.

The legislature also authorized:

- $5 million for a state industrial development plan.
- A turnpike spur from the vicinity of Downington on the present east-west tollroad to the city of Chester.
- A spur to connect the tollroad east of Pittsburgh directly with the Penn-Lincoln Parkway.
- Studies for a new cross-state highway system, to be part of the Pennsylvania Turnpike, from Stroudsburg to Sharon.
- $3.2 million for local municipalities to aid in construction and operation of sewage treatment plants. The subsidy is limited to 2% of the construction cost.
- $2 million in matching funds for airport construction.
- $1.9 million for flood-control projects.

Hearings attempt to determine . . .

Who Will Build the A-Plants?

The questions of who should build nuclear power stations and how fast they should be built were explored once again in recent hearings before the Congressional Joint Committee on Atomic Energy.

The hearings failed to bring forth a clear-cut position as to whether or not the U. S. is lagging behind Russia and England in its nuclear power development.

However, they did succeed in obtaining general agreement that, regardless of where the country stood today, there is more than can be done to accelerate the pace of atomic energy development.

• **Some kind of program**—Chances appear good that the government will underwrite some form of program. It may be that the AEC will undertake to build a certain number of new reactor types on a full-scale basis and contract to sell the steam to private utilities. This would avoid the charge of putting the government into the power business.

A new bill by Sen. Albert Gore (D.-Tenn.) proposing federal construction of six nuclear plants occasioned the hearings. Gore and his supporters noted requests from utility spokesmen for federal insurance aid on nuclear power projects for tax concessions and for exemption from the Utility Holding Company Act. These, on top of the government assistance being granted under the reactor demonstration program, they said, mean that the government is shouldering the major financial responsibility.

This being the case, the government might as well take on the entire project and retain full control. At the same time, they argue that private industry is dragging its feet and the U. S. is losing to the Russians and British.

• **Who is ahead**—Gore cited recent statements of Russian scientist I. V. Kurchatov that Russia is planning installation of 2,500,000 kw of nuclear power capacity during 1956-1960, with considerable capacity coming into operation during 1958. The senator also noted that the British plan to construct 16 dual-purpose reactors in ten years to give them approximately 2,000,000 kw capacity.

"It is one thing for our British friends to outstrip us in reactor construction, as indeed they appear likely to do. It is quite another matter for the Soviet Union to outstrip both us and the British," said Gore.

• **Not quantity but methods**—Following Gore, Atomic Energy Commission Chairman Lewis L. Strauss told the committee that the question is "not one of objectives but of method." Said Strauss, "Our present goal is more scientific knowledge, not simply more kilowatts. . . . We believe that the enforced adoption of arbitrary goals of killowatt capacity or numbers of full-scale reactors for an early date, such as 1960, is unwise because it would divert scarce technical skills from activities which promise greater results in subsequent years."

Strauss made three suggestions as to what could be done to push the program forward.

- If the AEC developed a reactor concept to the point where it was felt a prototype would be advisable, and if private industry was not prepared to undertake the project, he would recommend that AEC build it.
- He recommended that Congress act on the question of providing increased liability insurance to encourage industrial construction of reactors.
- He recommended vigorous action to relieve the technical manpower shortage.

Sen. Gore denies that his bill is an attempt to get the federal government into the nuclear power field. But at the same time he concedes that if the AEC built the proposed six reactors, it would have to observe preference laws—giving publicly owned bodies first call on the output.

Anticipating that the federal government will underwrite some form of liability insurance for nuclear power projects over and above the sum private insurers are willing to accept, observers believe that the private industry nuclear power program will forge ahead.

Engineers Hired to Survey Penn. Turnpike Operations

Pennsylvania's Turnpike Commission has engaged the engineering firm of Michael Baker, Inc., Rochester, Pa., to make a complete survey of its operations with a view to economy and efficiency.

According to Gov. George M. Leader, the study, which is to be completed in 30 days, may result in operating economies and help change the picture on the recently proposed and now definitely postponed toll rate revisions (ENR May 31, p. 25).

Gov. Leader, a Democrat, claims the former Republican-dominated commission "over-financed" the now financially hard-pressed eastern and northeastern extensions by $25 million and "wasted" another $10 million on mine-filling work in the coal regions. Some of the mine-filling contracts have been cancelled and court suits are pending (ENR May 10, p. 27).

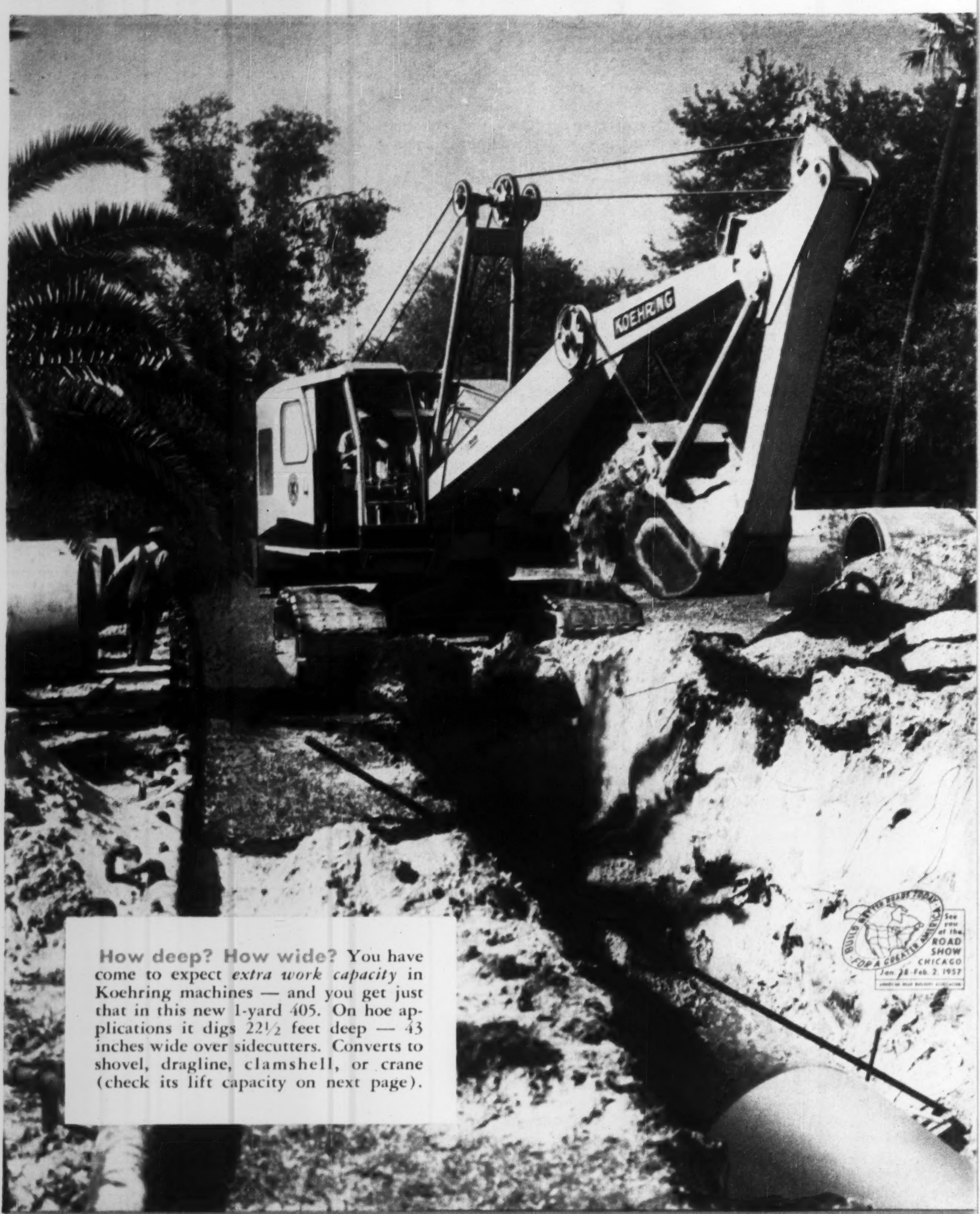
A New Secretary of Interior Steps In

The new Secretary of Interior—Fred A. Seaton—was pickel by Eisenhower for the Cabinet spot over Clarence A. Davis, Interior undersecretary, also from Nebraska. The decision figured as a master stroke to blunt Democratic attempts to make the "Republican give-away" and "public vs private power" key issues in the West. Seaton has no direct connection with the McKay regime at Interior, which has been attacked by the Democrats—whereas Davis is regarded as one of the strong men of the McKay team. Seaton is a Westerner, a publisher, a Republican of many years standing. He's had experience in Washington these past three years at Department of Defense and the White House—in each job dealing with problems with Congress.

He has already said he isn't sure whether he will carry out any specific McKay policies, but is going to carry on Eisenhower's power and water policies—including the so-called partnership policy. Partnership has been the keystone of the Republican approach to western public works projects—permitting local private interests to have the power part of western water projects.

The Administration contends that this does two things, particularly: (1) Gets the projects built quicker, since you don't have to wait on Congress to vote the money and (2) holds down the federal government expenditures and its control over essentially local affairs.

KOEHRING WORK CAPACITY *in action . . .*

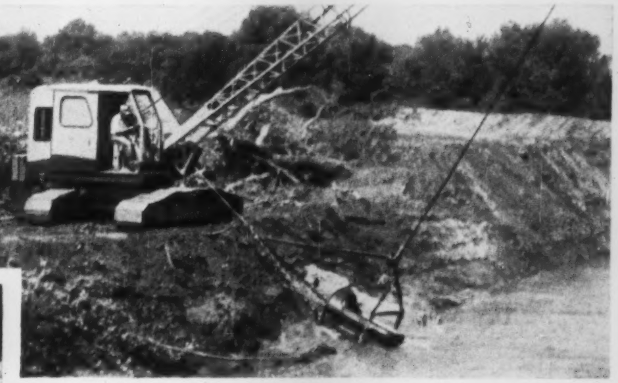

KOEHRING
BUILD BETTER ROADS TODAY FOR A GREATER AMERICA
See you at the ROAD SHOW CHICAGO Jan 28-Feb 2, 1957

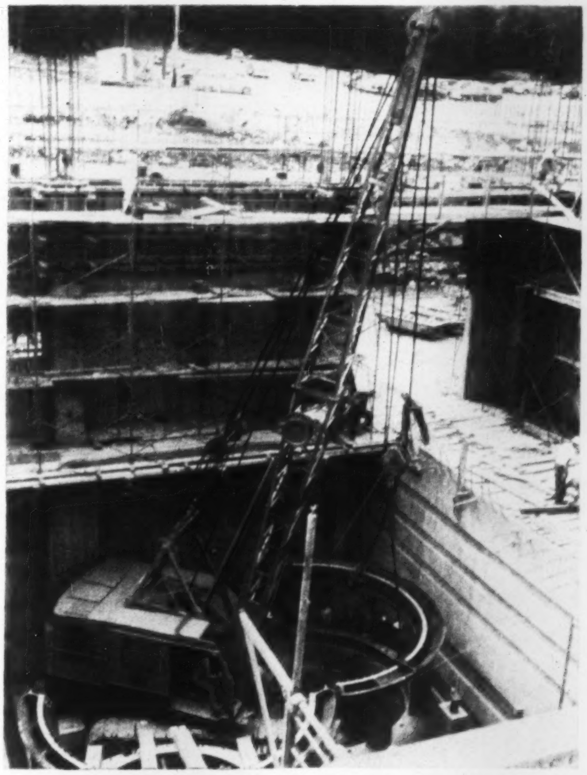
How deep? How wide? You have come to expect *extra work capacity* in Koehring machines — and you get just that in this new 1-yard 405. On hoe applications it digs 22½ feet deep — 43 inches wide over sidecutters. Converts to shovel, dragline, clamshell, or crane (check its lift capacity on next page).

KOEHRING COMPANY Milwaukee 16, Wis. *Subsidiaries:* JOHNSON PARSONS • KWIK-MIX

Pipeline yields right-of-way To lower street grade for a turnpike underpass, it was necessary to relocate this high-pressure gas line. Long sections of 8-inch steel pipe were easily lifted out of the ditch and loaded onto trucks by a Koehring 15-ton truck crane. It's equipped with a special clamp for grabbing the pipe. Travel is unrestricted on this mobile 205 truck crane. Overall width is 8 feet. Axle load distribution conforms to highway regulations in most areas — even when carrying 25 feet of crane boom over the steering end.

Flood waters backed up from a swollen river, filling this uncompleted drainage ditch — but that didn't stop the work. Contractor specializes on farmland drainage with this 305 dragline. It is a recent addition to the Koehring heavy-duty line — has all the standard attachments (more details listed below).





Down in the hole— On construction of a new powerhouse, Koehring 36-ton crane was run in through an opening in basement wall to install machinery. Here, it sets a speed-ring in place. For high lifts, up to 110 feet of straight boom can be used on this 605 crane — or, for extra reach — 100-foot boom with max. 30-foot jib.

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205 ON RUBBER	½-Yd.	**30,000 lbs.** **13,700 lbs.**	at 12-foot radius at 20-foot radius
305 CRAWLER	¾-Yd.	**30,000 lbs.**	at 12-foot radius
305 ON RUBBER	¾-Yd.	**50,000 lbs.** **15,800 lbs.**	at 10-foot radius at 30-foot radius
405 CRAWLER	1-Yd.	**40,000 lbs.**	at 12-foot radius
605 CRAWLER	1½-Yds.	**72,300 lbs.**	at 12-foot radius
1205 CRAWLER	3-Yds.	**190,000 lbs.**	at 13-foot radius

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Air Force conferees agree that . . .

Runway Maintenance Is a Complex Task

Nearly everything connected with the U. S. Air Force is big and is getting bigger—even the maintenance of its airfield pavements.

The complex and mushrooming problems of airfield pavement maintenance were the motivation behind the four-day conference held last week (May 28-31) at Air Defense Command Headquarters in Colorado Springs, Colo. This was the second such conference A similar one was held in June of last year, on a much smaller scale, at Wright-Patterson Air Force Base near Dayton, Ohio.

This year's meeting drew a total attendance of 150; the majority being specialists in airfield pavement design, construction, maintenance, or operation; or closely identified with supplying materials or equipment with which to do the work.

Air Force representatives of foreign governments (England, France, Germany and Canada), together with engineers from U. S. Air Force overseas commands (Caribbean, Far East, Northeast, Europe, and Alaska) attending the conference gave it a global flavor, and all major commands of the Air Force were represented.

• An Impressive Roster

Heading up the list of conferees were officials and engineers from the headquarters staff of USAF. The Office of the Assistant Secretary of Defense was represented by Frank E. Rutt, Chief of the Pavements and Ground Section. To round out the conference, representatives were invited from the Navy's Bureau of Yards and Docks, the Corps of Engineers, the Bureau of Public Roads, and CAA.

Maj. Gen. Marshall S. Roth, Acting Chief of Staff, Continental Air Defense Command, welcomed the group, then turned to Maj. Gen. L. B. Washbourne, Assistant Chief of Staff, Installations Headquarters, USAF.

"The primary purpose of this conference," said Washbourne, "is to discuss practical and objective methods of improving airfield paving maintenance . . . including not only day-to-day work but also recurrent work, repairs and modifications."

• Scheduled Maintenance

Leslie B. Crowley, Chief of the Pavement Section, USAF, who was conference chairman, stressed the need for developing a scheduled and systematized program for proper and timely maintenance of pavements, so that deficiencies could be evaluated to determine priority of correction.

In preparing cost estimates for maintenance and minor construction projects, he recommended that those intended for supervision by a construction agency be increased by 9% of the estimated cost of work items, to provide for engineering services.

The greatest single problem that exists within the Tactical Air Command insofar as airfield pavements are concerned, is the lack of day-to-day preventive maintenance. This generally is due, declared L. F. Trost, Chief Engineer of Buildings and Grounds, to the fact that operational requirements don't leave enough time for proper maintenance before major trouble develops.

Along this same line, another paper presented at the conference stressed the need for designing airfield pavements to reduce maintenance to a minimum. To do this, selection of high quality materials was suggested. This means stronger base courses for flexible pavement, higher flexural strength concrete for rigid pavement, and stronger sub-bases for both types.

A well prepared, dense non-plastic sub-base will practically eliminate pumping and faulting at the joints. Moreover, by using a relatively thin, high-strength concrete pavement on a good load-carrying sub-base, together with keeping the slab area small, additional life is gained for the pavement. It will also provide increased resistance to damage by fatigue from repeated loading.

• Fuel, Debris Are Problems

Spillage, heat and blast continue to create unsolved problems in such critical areas as loading ramps, service areas and at ends of runways O. E. Cox, Pavement Engineering, USAF, noted that there is a trend toward denser jet fuel which means less evaporation, and perhaps more spillage with corresponding increase in damage to the pavement. The fuel spillage problem will worsen as aircraft increase in weight and, eventually, all military aircraft except cargo carriers will be jet-powered, he said.

Keeping airfields free of debris is one of the biggest single maintenance headaches of the Air Force. Conventional broom-type sweepers are too slow. The only answer is a high-speed vacuum cleaning sweeper that can clean at least 1,000,000 sq ft of pavement per hour at speeds of 20 mph or greater.

As pointed out by one of the other speakers earlier in the conference, the cost of repairing jet engines damaged by the ingestion of loose materials from pavement surfaces is a staggering amount. At the depot level only, this runs about $18 million annually, it was said.

• Bituminous Paving

The four cardinal points of good bituminous pavement construction and maintenance (mixing, placing, patching and sealing) were described in considerable detail by the Asphalt Institute's district engineers, D. D. Dager, Harrisburg, Pa.; Vaughn Marker, San Francisco; J. F. Pearring, Denver; and Hugh A. Wallace, Dallas. In brief, they pointed out that:

- Four major controls are required to secure good flexible pavements: design, plant control, adequate foundation, and control of placing operations.
- This control must start at the stockpiles of raw materials and continue throughout the entire production sequence.
- Automatic controls and the best of equipment for measuring and mixing are becoming increasingly important.
- Maintenance of any pavement whether it is used as a runway, taxiway, apron or roadway should commence the moment that construction is completed.
- Of all the maintenance and construction operations connected with bituminous airfield pavements sealcoating has been given the least consideration. Careful attention must be given such basic operations as rate of application; proper proportioning of aggregate and bitumen; and rolling procedures.

• Concrete Paving

How to apply bonded concrete resurfacing, repair expansion joints and produce quality concrete for airfield pavements were discussed extensively by a trio of Portland Cement Association engineers: A. A. Anderson, Gordon Ray, and W. G. Westall.

Strengthening existing concrete pavements by adding a thin overlay of concrete, well-bonded to the old pavement, has proved to be an economical and practical procedure, said the first speaker.

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Northwest Water

Canada, U. S. may be near accord on Columbia River

Recent statements by U. S. and Canadian officials may be indicators that Canada is nearing some definite engineering conclusions on future power development of the Columbia River and will soon be ready to proceed jointly with the U. S.

• **Thomas Reid,** British Columbia Senator, has predicted that a decision to permit construction of Mica Creek Dam will be reached within three months. To cost $250 million, this dam on the Upper Columbia, has been proposed by a group of Puget Sound utilities to increase firm power at downstream U. S. plants by capturing 10,500,000 acre-ft of wasted spring flood flows (ENR Jan. 20, 1955, p. 47). Water releases would also serve future Canadian power plants on the Columbia or could be diverted to the Fraser River which is closer to existing load centers in Canada.

Apparently, if Canada makes a decision on Mica Creek Dam, it should have decided whether Columbia River flows are to be diverted into the Fraser since their legal basis for diverting is the use of wasted spring flows, or presently "undedicated" waters. Mica Creek would "dedicate" Columbia waters for Columbia River use under the framework of the Boundary Treaty of 1909 between Canada and the U. S.

• **W. A. C. Bennett,** British Columbia Premier, talked like a man who knew where he wanted to go when he hinted that British Columbia would be willing to cooperate with the U. S. on the Columbia in exchange for a land corridor through the Alaskan panhandle to give northern British Columbia access to tidewater and so promote mineral development in the area. Alaska's delegate to the U. S. Congress, E. L. Bartlett, seemed interested, but only if Canada leased the U. S. a corridor containing the 100 mi of the Alaska Highway that runs through Canadian territory on a cut-off between Fairbanks and Haines.

• **Len Jordan,** chairman of the U. S. section of the International Joint Commission, added further intrigue when he stated that a current bill in the U. S. Senate would provide a basis for prompt action on the Columbia River. The bill, reported out of the Senate Interior Committee, would allow the federal government to pay builders of upstream non-federal dams for adding to the firm power output of existing federal plants. Presumably, this would include Canadian-built dams and would be a subsidy to Canadians in recognition of the contribution of upstream storage reservoirs.

It would also compensate Canada for building on the Columbia in the eventuality that greater investment would be required there compared to Fraser River dams plus diversion (waters diverted into the Fraser would be lost to U. S. plants on the Columbia).

• **Howard N. Walters,** retired sales manager of British Columbia Electric Co. (which has a big finger in the power pie), pointed out that Canadian reluctance to consummate agreements with the U. S. for development of Upper Columbia River reservoirs is based principally on lack of knowledge by Canadians of the river's power potential.

"The United States is in the fortunate position of knowing exactly what it is talking about when discussing Columbia River power as the result of a very extensive engineering study in the U. S. extending back over twenty years. We in Canada have not been in the same position," said Walters in a recent speech.

Last week the State Department announced agreement had been reached with Canada to review the Boundary Treaty of 1909 in the light of "various complicated legal, economic and engineering questions" arising from international aspects of not only the Columbia River but also the St. John and Yukon Rivers.

These latest signs coming on top of recent considerations of the Columbia River question by President Eisenhower and Prime Minister St. Laurent and by the U. S. Senate Foreign Relations Committee have raised hope for a reasonable, prompt settlement of the dispute.

Texas High Court Voids County Road-user Taxes

The Texas Supreme Court recently invalidated a Harris County measure seeking to impose registration fees to finance the acquisition of rights of way for state and federal highway construction in the county.

Although apparently leaving the way open for the State Legislature to pass a general act permitting imposition of such local levies, the high court held that enabling acts that permit a single county to levy such taxes are unconstitutional.

The ruling voided such special acts passed for Harris, Dallas and Hidalgo Counties.

Try, Try Again

Colorado governor to try new tack to build tunnel

Armed with authority granted in a new state law, Colorado's Governor Ed C. Johnson will be in Washington this month to push for inclusion of a new Continental-Divide tunnel in the proposed interstate highway system.

The tunnel in question is to be at one of two sites on U. S. routes west of Denver: At Straight Creek, on Highway 6, near Loveland Pass, to cost $7,596,835; or at Berthoud Pass, on Highway 40, to cost $16,465,440. In either case, the tunnel would be 4 to 6 mi long, have a 14-ft clearance, and a roadway width of 28 ft 9 in. Although consulting engineers had reported adversely on costs and economic justification of the tunnels, Johnson had directed the State Highway Department to call bids anyway (ENR Mar. 22, p. 26) in which contractors would furnish their own designs.

The low bids were furnished by a joint venture known as Colorado Tunnel Constructors, Inc.—made up of Brown & Root, Inc., A. S. Horner Construction Co. and Colorado Constructors, Inc.

One trouble was a previous legislative limit of $16 million for the tunnel, and Johnson threatened to call a special session to get this raised. However, the legislature May 16 passed a bill (and Johnson signed it) authorizing issuance of $18 million in anticipation warrants—if the federal government would approve inclusion in the interstate system.

Construction Started on N. J.-N. Y. Tollroad Link

The first shovel of earth has been turned for construction of a 9½-mi., $18-million feeder link from the northern terminus of New Jersey's Garden State Parkway to the New York State line, near Montvale, N. J.

The divided highway, will be picked up at the state line by a 2½-mi, $4.3-million spur of the New York State Thruway, thus completing a direct connection between the 424-mi Thruway and the 164-mi Parkway. An "open-toll" facility, the extension will serve six interchanges in the northern New Jersey area, with its one toll plaza located at about the one-third point along the route from the present terminus.

Passing through generally rural and undeveloped areas, the center island of the parkway link will range from 40 to 200 ft, with the average about 85 ft.

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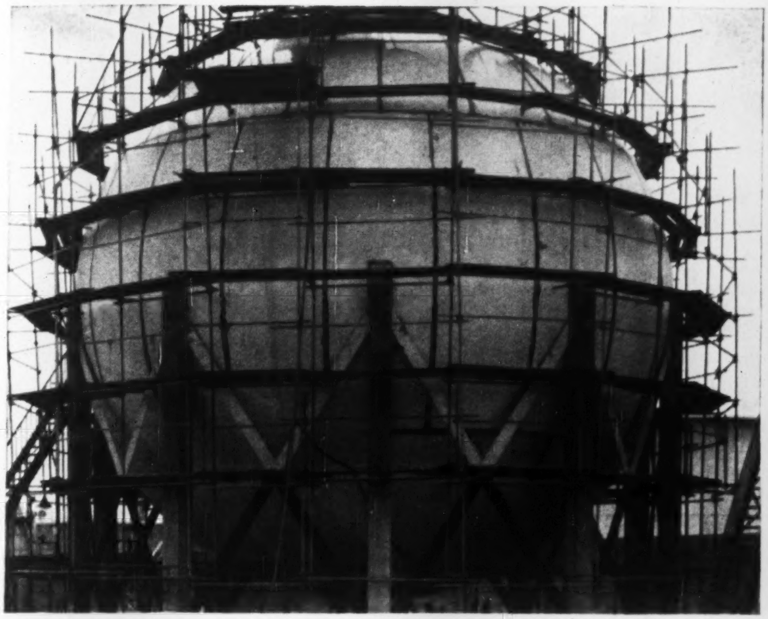
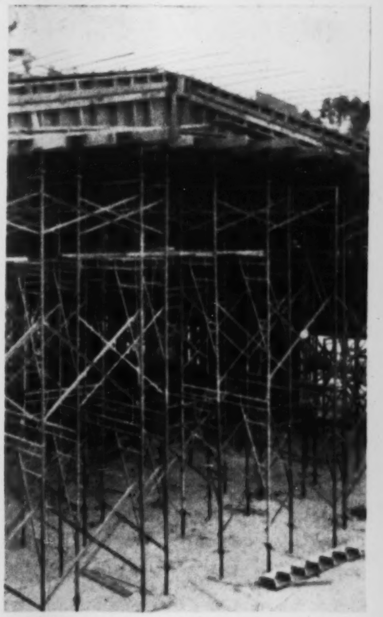
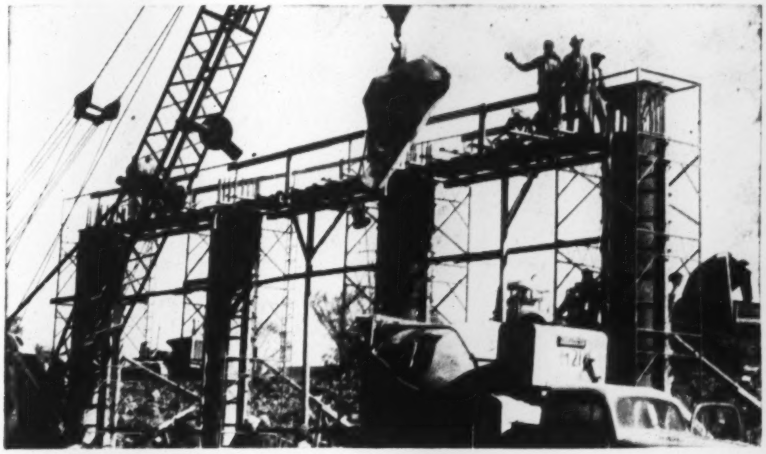


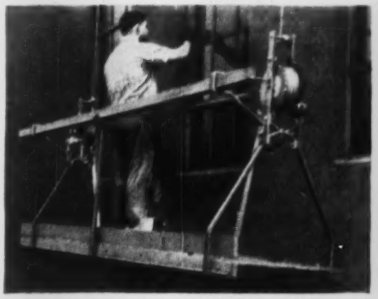
ODD SHAPES—The ability to conform to odd shapes, curved forms, uneven terrain and surfaces makes "TubeLox"® Scaffolding valuable on difficult, hard-to-get-at jobs. Interlocking 2" or 2½" o.d. steel tubes and couplers speeded erection and dismantling of the scaffold for maintenance work on this Union Oil Co. sphere at Wilmington, Calif. Notice how the "TubeLox" Scaffolding is set back to conform exactly to the shape of the sphere permitting workers to get closer to the job.



HEAVY LOAD—"Trouble Saver" Sectional Shoring frames, on 2' 6" centers, speed work on Mess Hall, Marine Corps Base, El Toro, Calif. Heavy, high-arched 62' beam varied from 2' 2" to 3' 6" deep by 1' 6" wide. Allison Honer Co., gen. contr.



SMART ENGINEERING—Accurate positioning of prefabricated "Trouble Saver"® Sectional Scaffolding saves time and money on construction of four pier columns for one of 5 overpasses leading to a lower section of the New York State Thruway. Scaffolding supports vibrating machine and workers, and helped in erection of formwork for above-ground sections of pier shells. Carlo Bianchi, contractor.



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No Land Gouging

Pennsylvania aids industry to acquire treatment sites

The new Pennsylvania law authorizing industry to acquire property on which to construct state-ordered waste treatment works by eminent domain is designed to prevent excessive price boosting by neighboring land owners.

In explaining the law, Robert J. Trace, counsel for the State Sanitary Water Board—the clean streams enforcement agency—said it was made necessary by the "ridiculous" prices asked for property that private industry needed to comply with board edicts.

The new right of eminent domain may be exercised by industry only on specific authority from the pollution control agency. Land so acquired may be used only for waste treatment purposes. Use of eminent domain will be authorized only after normal means of acquiring needed property have been exhausted.

Illustrating the land situation faced by many plants, Trace cited the case where a company needed three acres of adjoining farm land for a settling lagoon. The land was part of a 136-acre farm, which was considered no prize as farms go. The farmer offered to sell the land at $1,000 an acre but stipulated that the industry "must buy the whole farm at that price."

Pennsylvania industry has spent an estimated $150 million on state-ordered treatment works since the clean streams program shifted into high gear eight years ago. Waste disposal facilities have been built or are under construction at over 700 industrial sites. Another 1,400 concerns have abated pollution by discharging to lagoons; cesspools and city sewers and by making in-process changes to eliminate stream pollutants.

Some 300 mills and factories are under orders to abate stream pollution, while the Sanitary Water Board is investigating an additional 450 suspected polluters.

Koolau Approach Bids Opened While Damage Suits Pile Up

New action was afoot last week to insure completion of Honolulu's ill-starred Wilson Tunnel through Koolau Mountain.

J. M. Tanaka Ltd. was awarded a $1.4 million contract to build a 3.2-mi section of approach highway to serve the tunnel when it is completed late in 1957.

This particular section is being undertaken as a territorial federal-aid project; remaining sections of the approach road will be financed by the city-county of Honolulu.

Meanwhile, damage suits against the city-county for five deaths that resulted from the 1954 collapse (ENR Aug. 19, 1954, p. 28) have been filed in Honolulu Courts, for a total of more than $1 million. All the actions charge negligence on the part of the city.

In other legal maneuvers, however, the Hawaii Supreme Court upheld a lower court ruling that the contractor (E. E. Black, Ltd.) cannot be sued because of the Territorial Workmen's Compensation Law, which provides that acceptance of its death benefits automatically cancels the right to sue the contractor.

City-county officials have indicated, nevertheless, that they may attempt to bring suit against the contractor anyway.

Water Samples Safe Before Treatment, Unsafe Afterward

The water system at Toledo's new express airport is equipped with softening and chlorination equipment and draws upon deep wells that are free of pathogenic bacteria. Yet Ohio State Health Department inspectors have turned up a number of distribution samples that are bacterially "unsafe."

No enigma here though. On one occasion the treatment plant was idle.

The State Health Department made the following comment: "No doubt unsafe water from the distribution system could be avoided if chlorine were put in."

The airport promised action and also assigned supervision of the treatment equipment to a licensed waterworks operator.

Extra-Big Bars Make Concreting Easy

Deformed reinforcing bars, weighing 13.6 lb per ft and measuring 2⅜ in. in dia, were specially rolled for the foundations of the new Prudential Life Insurance Co. Building, Los Angeles, Calif. Use of the larger bars made possible wider spacing of reinforcing than with the largest size standard deformed bars, thus permitting easier concreting. Four or five of these jumbo-size reinforcing bars are equivalent to 10 or 13 No. 11 bars (1⅜-in. dia), which are the largest size covered by ASTM Specification A305.

Because of poor soil conditions, foundations for the new building were designed as a floating mat—a thick reinforced concrete waffle slab. Foundations are resting upon an extended soil area of the LaBrea Tar Pits.

Measuring 7 ft at their thickest section, the foundation mats are 108 ft wide and 158 ft long. Preliminary designs showed that if conventional reinforcing bars were used, the cluster required would be so dense that it would hinder placing concrete.

Murray Erick Associates are the consulting structural engineers for Welton Becket and Associates, architects-engineers for the job. William Simpson Co. is the general contractor, and Anthony C. Meehleis Co. fabricated the reinforcing bars.

The large bars were specially rolled by Bethlehem Pacific Coast Steel Corp.

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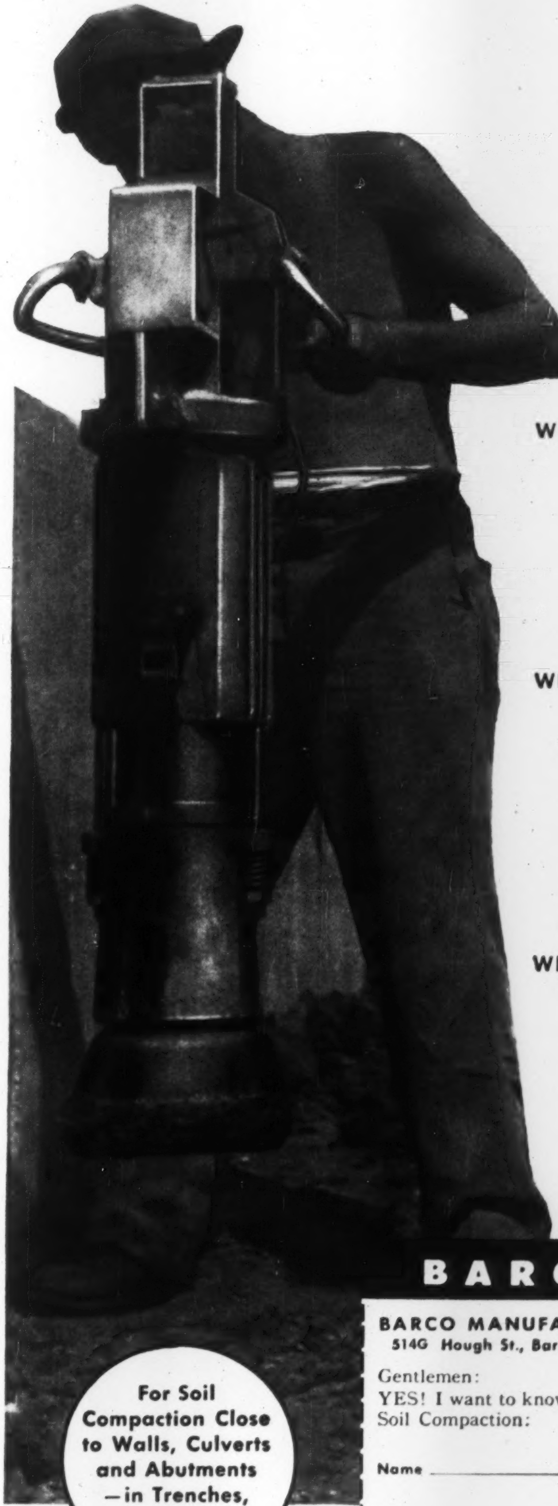

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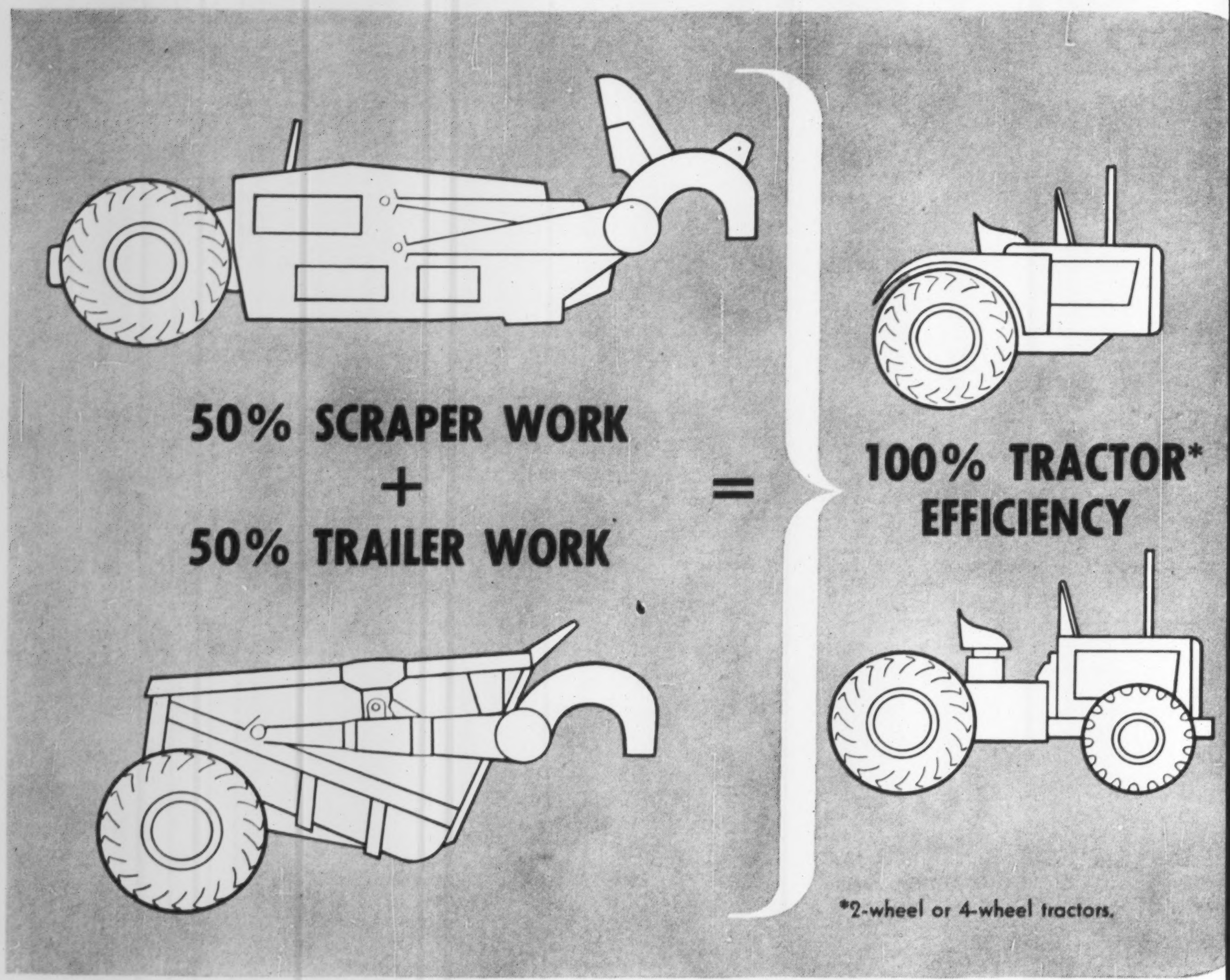
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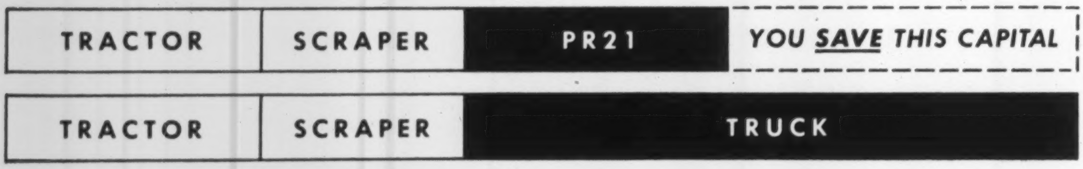

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ENR sponsors a conference on—

Federal Aid for Sewage Works

Legislation in Congress this session has had a new wrinkle: federal grants to cities for construction of sewage works. Recognizing that the idea once raised would not fade away even if dropped from legislation due to be passed this year, and that there might be merit in some measure of federal aid, ENR called together at a breakfast-conference in St. Louis May 9 a representative group of key people in the stream pollution abatement effort. In their invitation to participate, these conferees were asked to consider the following questions:

- Are you unalterably opposed to federal aid for sewage works construction?
- Is there some parallel to federal aid for highway construction?
- Might there be justification for federal aid in certain situations of interstate stream pollution or of municipalities faced with unduly excessive costs in treating their sewage?
- Could a formula for meting out federal money be conceived?

Abel Wolman
Remembers PWA

Edward Cleary
Heads an eight-state agency

The conference was opened by Arthur J. Fox, Senior Editor, Engineering News-Record, who acted as moderator.

MODERATOR: Gentlemen, your presence here evidences your interest in the proposal that federal grants should aid in the construction of sewage works. It is to discuss that proposal that we have called you together. Some may oppose it; some may be in favor. Whatever your opinions, we have invited you here to air them. You know about Senate Bill 890, designed to replace the existing Water Pollution Control Act, which expires June 30. Many of you during 1955 were helpful with shaping this Senate bill. Now, in 1956, some of you have likewise worked on a House bill for the same purpose. In its provisions, the House bill seems quite comparable to the Senate bill, but it has one new and different provision: It would authorize grants of $50 million a year up to a total of one-half billion dollars as federal aid to construction. Originally, the provision was for double that amount.

To begin discussion, it might be well to explore the origin of the proposal in H.R. 9540, and Mayor Weatherford, as spokesman for the American Municipal Association, could shed some light on that subject.

WEATHERFORD: I might give you our policy as a municipal association representing 35,000 cities. Municipalities are not financially able to construct sewage treatment plants fast enough. We are losing the battle against water pollution. The only way we can win this battle is with federal aid. That is the policy of the American Municipal Association.

MODERATOR: We would like to explore here how cities feel about federal aid.

BAXTER: The position of Philadelphia and practically every other city in the country is that we need more and more federal aid. That is the city's position. All you have to do is read the Kestnbaum report (on intergovernmental relations) and find out how much money is being taken in federal taxes as compared to local and state taxes to see the reason. However, Philadelphia has no particular

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Did Philadelphia's clean-up job

Samuel Zack
Experienced with state aid

Mayor Robert Weatherford
Speaks for 35,000 municipalities

interest in this grant-in-aid because our sewage treatment project is just about finished. The $80 million job now is nearly finished because the city, despite a constitutional debt limitation, went out and established a sewer rent, and now Philadelphians are paying for their sewage plants. I think one of the things that has to be weighed is the fact that Philadelphia—and there are other cities that have done this—will be helping to pay for the grants-in-aid to other cities while at the same time they carry the full load themselves.

LEE: We feel that there are some areas in which federal grants-in-aid will be needed. We do have some definite areas where pollution abatement is vitally necessary, where they just do not have the financing. We feel there can be a formula devised; and it should be used.

VEATCH: Your specific question was what cities want? I think the honest answer to that is they all want federal aid if they can get it. I think that a number of cities are holding back on going ahead, thinking that they can get grants. In other words, it is a retardant at the moment. My own opinion is that most of them big enough to create any sort of pollution nuisance can finance in some way if they will.

FUHRMAN: A community's water and waste problem starts from the point where it takes water from a stream and stops after sewage has been discharged and when that stream has recovered to be decent for other purposes. It seems to me that that is a closely related cycle. Why do we close our eyes to that intimate relationship between the two and the convenient financing method that it suggests? People never say, "We won't have a public water supply because it costs us two and a half dollars a month." They say, "This is a must for public health benefit." When they make that choice they also are creating or potentially creating a pollution problem, which ought to be part of the same package, financially.

WEATHERFORD: I want to make this clear: there isn't a city in the American Municipal Association who wants anything for nothing: anything that we can finance, we will finance. Don't ever misunderstand me for one minute, the 35,000 cities of America, who are known as the American Municipal Association, don't want anything for free.

MODERATOR: Gentlemen, we have heard expressed here rather an accord that all cities would want federal aid for sewage treatment plant construction if they could get it. We have also heard defended the cities' position as to recognition of their responsibility in this matter. Suppose we go now to determine what good it would do the cities if they got the federal aid.

POOLE: I think any Indiana city that got a quarter of a million dollars or a half million dollars from the federal government as a part of the cost of a sewage treatment plant might say it did them some good. But it is my opinion, as one who is attempting to administer the pollution abatement laws of the State of Indiana, that the figures that we are talking about in federal aid, $50 million per year, would retard Indiana's sewage treatment program, and I believe that for these reasons: If the sewage treatment funds were distributed on the same formula that the hospital construction funds are, the State of Indiana would have, oh, probably $1.1 million per year out of a $50 million appropriation. If that is administered, then, on the basis of 33% of the cost, that could very easily pull our construction program down to a $3.5 million per year program, because my experience over some twenty odd years has indicated that if there is a possibility of federal aid next year, you have great difficulty in getting a city council to vote a bond ordinance that incorporated the complete cost of the project and to start it this year.

VEATCH: *Unless more money can be put in so it is a real incentive, it is going to retard progress of pollution abatement. Isn't that the general thought, leaving out the philosophy of whether grants are proper?* I think that would be the understanding Mayor Weatherford should take away from this meeting.

The Conferees

Samuel S. Baxter, Water Commissioner, Philadelphia, Pa.

Robert F. Boger, Publisher, Engineering News-Record

Edward J. Cleary, Chief Engineer and Executive Director, Ohio River Valley Water Sanitation Commission, Cincinnati, Ohio

Arthur J. Fox, Jr., Senior Editor, Engineering News-Record

Ralph E. Fuhrman, Executive Secretary Federation of Sewage & Industrial Wastes Associations, Washington, D. C.

Harry G. Hanson, Officer-in-Charge, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio

Howard Jacoby, Associate Editor, Engineering News-Record

David B. Lee, Director & Chief Engineer, Bureau of Sanitary Engineering, State Board of Health, Jacksonville, Fla.

Blucher A. Poole, Director, Bureau of Environmental Sanitation, State Board of Health, Indianapolis, Ind.

R. S. Rankin, Dorr-Oliver, Inc., Stamford, Conn.

N. T. Veatch, Black & Veatch, Kansas City, Mo.

Mayor Robert Weatherford, Independence, Mo.

Prof. Abel Wolman, Johns Hopkins University, Baltimore, Md.

Samuel I. Zack, Gannett, Fleming, Corddry & Carpenter, Harrisburg, Pa.

WEATHERFORD: Only understanding I get from this meeting now is that you fellows are in favor of pollution abatement, but you want to hand every municipal government in the U. S. a do-it-yourself-kit.

For or against federal aid?

CLEARY: Is federal aid desirable? I think we ought to look at that question before we get into the detail. My answer is that under certain conditions federal aid could be meritorious in promoting sewage treatment construction. Now, when I say "certain conditions", the two conditions that I would have in mind would be, first, that it could be an incentive, but more importantly, federal aid might be a means to equalize a burden. The average cost for primary treatment is $26 per capita. That is the cost of sewage treatment—not sewers. The maximum is $48. The minimum is $11. If the people in Cincinnati spend $26 per capita, and we find that in Louisa, Ky., it is going to cost $48 per capita, that is an unequal burden.

I would suggest, therefore, that herein may lie some principle of allocation. If you can establish the norm for the area, every person in this area should pick up that part of the check. Beyond that it may be a burden, and the federal government might be able to promote construction by picking up the tab for the additional.

WOLMAN: It is difficult to escape a kind of cynicism about the federal grants in aid if you live long enough. As an old PWA director, I had considerable interest and considerable part in the initial legislation for public works grants in aid in the Thirties. The obvious reason then was to stimulate reduction in unemployment. I am fully aware that there now are places where the burden of payment is very high. I am equally aware, that they are well in the minority in numbers, in dollars, and in effect on the stream pollution abatement program.

It's very interesting to compare the Thirties with '56. In the Thirties we went to federal grants-in-aid because we were literally in the dumps financially. We now talk of federal grants in aid in the most prosperous period that this country has even seen, and I confess it is a little difficult for me to prove to myself the necessity of turning to Washington for help when I believe the resources of the country are at their maximum. I myself feel that both states and others would be retarded in installations, not necessarily by the grant-in-aid, but by the promise of the grant-in-aid, which is held dangling in front of you, and which in quantity, really, is not much of a stimulant. Unless you move to the billion dollar level you don't get the shot in the arm. You get a kind of a promise which really has no quantitative significance to the country as a whole.

I do believe it would be well to list the communities in the United States who have paid their own way. There are literally thousands of them. I don't share the view that they simply should be ignored. I do share the view, although I think it is quite improbable, that you could devise a federal formula which would be non-uniform in application, to support areas that need support and not support others. In the first PWA act, Secretary Ickes introduced a formula which was not non-uniform on the very easy assumption that you ought to give federal support in that critical period to areas that needed it most. I think it lasted less than a week in Congress, for obvious reasons. Every Congressman said, "You mean to say that I am going to put out money and not get any of it back?" What you got, of course, was a straight across-the-board

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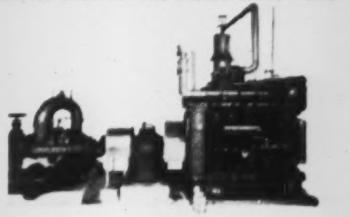

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45% grant in aid to everybody, and what you also got in turn, was a vast amount of money distributed to areas that did not need it.

You asked in your fundamental question, are you unalterably opposed to federal grants in aid? I hope I have sufficient flexibility left to say that I am not unalterably opposed. I would add, however, that I would have to be shown, first, that there is necessity; secondly, that it would really stimulate a rate of increased expenditure; and, third, that it would not bring with it a retardant, and, actually, a total increase in net cost of construction. I remind you that PWA grants increased costs of construction, did not decrease them. As a matter of fact, the record would show that the 45% grant just about represented the increased cost, and you would have been just as well off without it.

VEATCH: I have a very deep conviction—this is a deep, personal conviction or I wouldn't say it—that we had better do everything we can to preserve our economy than to, overnight, take care of pollution. If there are communities, small ones, that absolutely can't finance without federal aid I think their contribution to pollution is less of a hazard than the promulgation of a federal grant.

ZACK: I know of no case where a municipality, with a will to build a project, hasn't been able to do it. Yet, I am for federal aid, and I am for it for this reason: I think it is the only way that you are going to get a mass cleanup of pollution in our lifetime. You need a stimulant of government aid to accomplish this mass cleanup program.

MODERATOR: In this question of pollution abatement, perhaps we should address ourselves to the question of unwillingness to pay rather than the inability to pay.

WOLMAN: That is the real question. And that brings you to the fundamental question as to whether or not peoples' desire, their intent and their decision, should simply be ignored.

LEE: We have been talking pollution abatement for fifty years.

WOLMAN: We will talk about stream pollution for the next fifty years.

LEE: That is true, but unless we have a progressive pollution abatement program, we are still going to be doing it. I still feel that we need some aid, I won't say state or federal, but perhaps it comes out of federal. We have some rather serious small areas. If they could get 30% of their project. . . .

WOLMAN: Off the cuff, what proportion of your total problem falls in that classification?

LEE: I would say 5% or less.

WOLMAN: Are you going to disperse grants-in-aid on the federal level for the other 95% in order to catch that 5%?

LEE: No, I said in my previous statement that I believe a formula can be devised.

VEATCH: I doubt very much that a formula would pass Congress.

Does the need exist?

HANSON: May I comment on one thing that I haven't heard discussed is the speed with which development is taking place today—population and industrial development. It is a factor that it seems to me deserves consideration. How much time do we have? For whatever reasons, there seems to be agreement that construction is not taking place as fast as it needs to take place. The reasons may range all the way from a simple awareness of the need and the responsibility by the communities to something more akin to what the G.I. needed to buy a house, something he didn't have, credit, low interest rates, long term loans, outright subsidy, whatnot. If such aid is needed it ought to be demonstrable. I feel we don't quite have enough facts on this whole situation at hand yet.

When our Department (the U. S. Public Health Service) was framing its position on construction aid, they called in a set of bonding consultants. These bonding consultants came up with doubts that construction aid was necessary at this time. The fact indicates to me that the factual information at hand probably was insufficient, and I would like to put in a plea, therefore, for the kind of factual survey that would give us information, which I do not believe is available now.

MODERATOR: How should such study be conducted? The American Municipal Association has some information already. Is the Federation of Sewage & Industrial Wastes Associations perhaps a source of information here?

FUHRMAN: We haven't much in the statistical field that would be very helpful, nor any planned study.

POOLE: With all due apologies to the American Municipal Association, I don't think we have anything that you can latch onto, on this business of ability to pay.

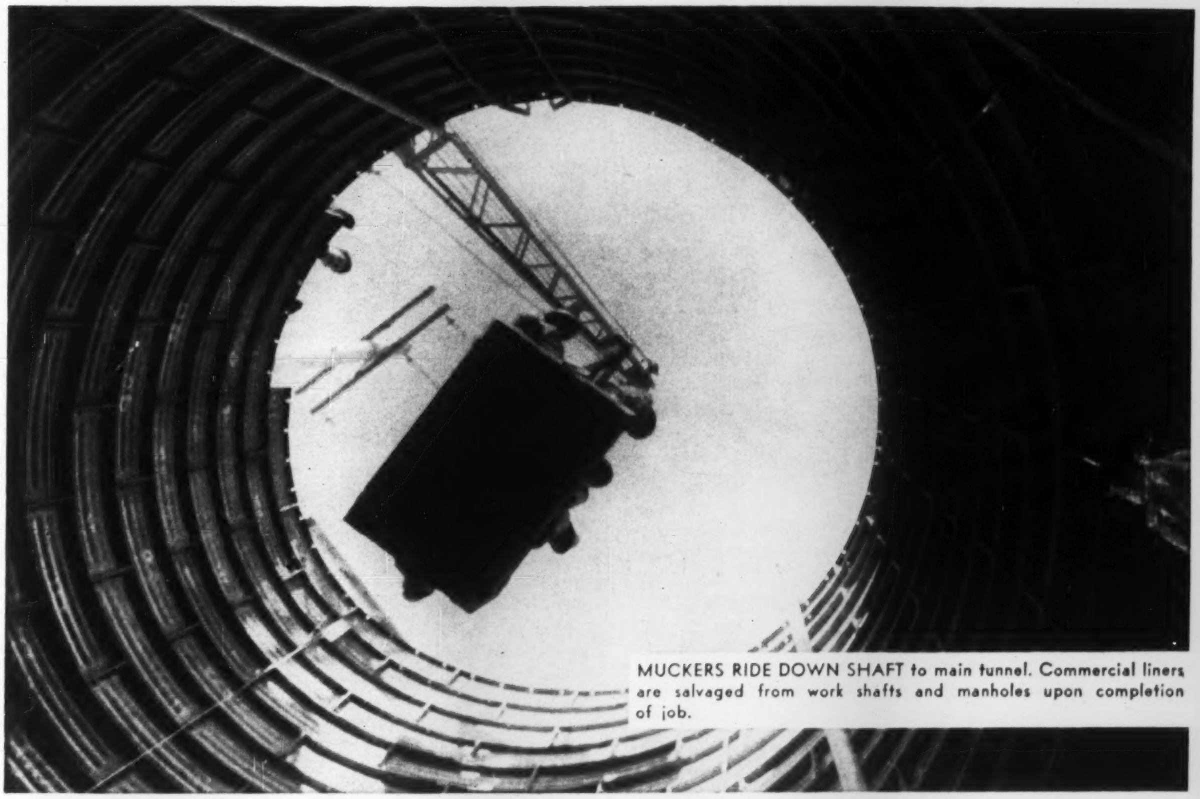
WEATHERFORD: May I inquire how many of these gentlemen here today have been up against the administrative phases that we of municipal government faced? I think we are sitting on an intellectual puffball way up there the way it sounds to me.

WOLMAN: Let me, for one, deny that. I think a large proportion of the people sitting here struggle with municipal finances. We're not talking theory; we're not talking, as the Mayor indicates, intellectual puffballs. We're talking about the realities of administration in this country, realities of fiscal responsibility. We're talking about how you can speed up these installations.

RANKIN: You are also speaking of speed of construction but materials available for construction are in very tight supply right now, limited supply. I wouldn't know what the impact of a greatly accelerated sewage treatment program would make on availability of materials. Conceivably your costs could go up.

CLEARY: To come back to the comment that Harry Hanson made about the determination of financial hardship, that question was faced by California several years ago when it built up a revolving fund for distressed communities. It might be well to pursue a review of that study. There is some precedent for work on a formula for determination of financial hardship.

HANSON: May I make one other comment with respect to the great concern over whether we can devise a formula which will fit every situation exactly. I am a little amazed



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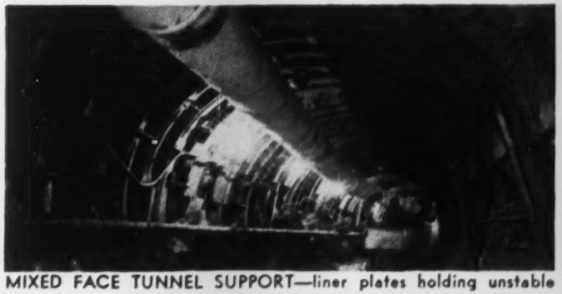

MIXED FACE TUNNEL SUPPORT—liner plates holding unstable ground in top heading are pinned and supported on steel posts bearing on stable ground.

by this concern over absolute equity. If we look at any of our public fiscal methodologies, we don't find absolute equity.

WOLMAN: Harry, may I suggest you put into the record that the Public Health Service has developed in the hospital field, a non-uniform formula.

HANSON: You have it in the record, and it is correct.

VEATCH: Mayor Weatherford, would your organization make a study as to financial ability and needs of your members? Would that be feasible?

WEATHERFORD: *Certainly, and it is mandatory. The first thing you have to do is analyze your needs and your ability to pay before you can do anything. It is imperative that it be done.*

Is it a federal problem?

JACOBY: Professor Wolman suggested that we talk about who shall aid the cities. What is the justification for the federal government getting into the picture? In highways, one of the chief reasons for the big program is that we need a connected network of highways in time of war. With schools we have perhaps less of a solid rationale, but educated youth is a national resource in its way. I wonder in stream pollution whether we have that direct connection with the federal, whether it is not a state problem.

WOLMAN: For some ten years, I was Chairman of our National Water Resources Board that reviewed all water projects in this country by presidential directive as a continuing task. It was very instructive to see, as time went on, how national interests became extended and redefined. You all remember also that national defense became a basis for accepting projects in every field. I would rate the stream pollution abatement necessities of the country as having by and large a minimum of national significance. I hasten to add that that is not the same as saying that there isn't an overwhelming national interest in preserving clean streams and avoiding dangers to health. They are not synonymous. There is not only a national interest in stream pollution abatement, but I think there is a national responsibility in it.

CLEARY: If it is a national responsibility, how far should the national government participate then, financially?

WOLMAN: *I would say almost zero, unless the kind of inventory which I assume either the Public Health Service or some equivalent will ultimately, and I hope fairly promptly, bring before the people in this country establishes two points: The inability to pay and whether or not we have reached the point where the rate of construction requires a federal grant.*

ZACK: The state has an important part in the picture. I would like to see a formula worked out whereby the state has a responsibility, and the federal government matches what the state does in some measure.

BAXTER: Pennsylvania came up with a formula. In the same way there is now agitation for federal grants, the whole community in Pennsylvania wanted the state to make grants. Pennsylvania said if anybody built a plant, it would contribute an amount up to 2% to help carry—both financial and operating costs. That might really be a way that we might help these small cities that have had trouble. That Pennsylvania Plan is really worth looking into. Whether the funds come from the state or from the federal government is a matter for discussion.

ZACK: I know four or five municipalities that tried to finance projects several years ago and could not get investment bankers to go along with them on the revenue basis. The state subsidy was passed in Pennsylvania, and the same municipalities got financing in a period when financing was even more difficult than it had been previously. It doesn't take much stimulation to put over a project. I think you need stimulation, and it would even help if the government could pledge its credit.

VEATCH: What is 2% of the cost going to do in firming up a sale of a revenue bond? I question whether your 2% at Pittsburgh had anything to do—

ZACK: I'm not talking about Pittsburgh. Pittsburgh, Philadelphia and New York can take care of themselves. I'm talking about the municipalities maybe up to 250,000 people, 1,000 up to 250,000 people.

HANSON: Philosophically, we may question whether the financial aid we are discussing here, is in effect a grant or whether this is simply a redistribution of taxable income from one level of the government to another.

This Group's Conclusion

CLEARY: The questions posed in your invitation provide a basis for summing up: Are you opposed to federal aid unalterably? As I see it, the justifications for it might be two: (1) equalization of burden; (2) an incentive or a reward to getting on with the job. The question was: Are you unalterably opposed?, and I think no one in this group is unalterably opposed. Is there a parallel between pollution control and schools and highways? My answer would be yes, if we accept the philosophy that a localized sanitation condition affects the national broad interest. Pollution is no respecter of municipal or state boundaries; there is some parallel among the grants that we have discussed. Now, the third point: Is there justification for federal aid in clearly defined areas? I definitely believe there is, and I think it is in connection with smaller communities. Now, your fourth question was: Do you think a formula could be devised? Having accepted the philosophy that we want to try to equalize the burden, then we might say that every community have a financial stake in some sort of treatment on some per capita basis beyond which the federal government may pick up the added amount. That is my summation of some views I heard.

WOLMAN: May I add a point which has appeared somewhere in our discussion? There are alternatives to federal grants-in-aid, which ought not to be lost in the summary. We referred to the possibility of state aid. Harry Hanson commented on the fact that when you give federal grants-in-aid you are returning to the local areas money which was collected from the local areas. We have the recourse of seeing that there is an adjustment in our tax structure which many people feel is essential for the survival of local communities. As a group we are opposed to federal aid, but not unalterably opposed.

LEE: That is right.

VEATCH: Subject to need.

WEATHERFORD: I am appreciative of the opportunity to come here and be with you gentlemen, and in behalf of the American Municipal Association I want to thank you for this courtesy.

This time and money-saving use of Stang wellpoints on a pipeline crossing of the Santa Ana River in California, for contractor Ukropina, Polich, & Kral, provided the ideal solution to an exceptionally tough water handling problem.

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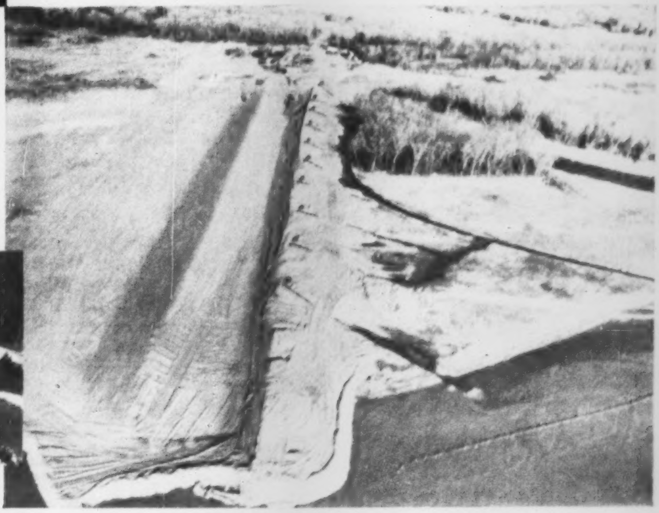

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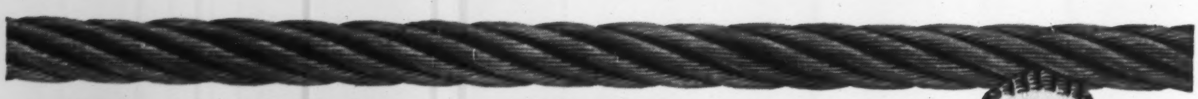

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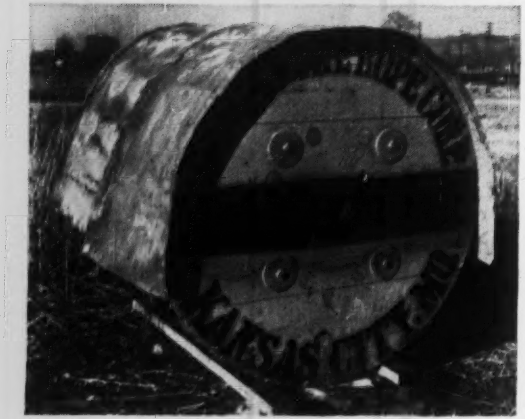
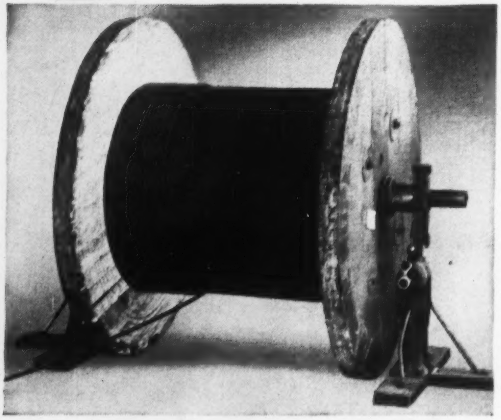


Store Rope Like This

Keep spare rope in a dry, sheltered place free of dust, vapors or fume-laden air. If stored out of doors, set reel on blocks off the ground. Clear away weeds and grass and protect with a waterproof covering as shown. Check each month for rust caused by moisture collecting on the rope. Paint with a heavy crankcase or cylinder oil if rust is discovered or even before it shows up if moisture is present.



Unwind Like This

When getting ready to install the rope, special care should be taken to see that the reel is set up for smooth, easy unreeling. Set reel up on jacks as shown above and unreel so the rope pulls off from the bottom of the reel—*not* from the top. Coils should be put on a swift or rolled on the ground to pay off the rope. Kinks or "doglegs" may result from incorrect unreeling, seriously damaging wires of the rope and greatly reducing the ultimate life.

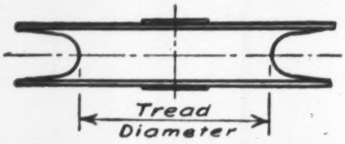
Research Adds Factual Data On Sheave Sizes

Until recently determination of sheave sizes has been by rule of thumb, experience and meager factual data. The influence of variables in operating conditions on rope life must still be determined by experience.

Insofar as bending stresses alone would be the primary cause of rope failure, exhaustive bending tests have established factual data giving a better guide than the former fixed sheave diameter and construction ratio tables.

These tests were conducted under the auspices of the Wire Rope Technical Board and the American Petroleum Institute.

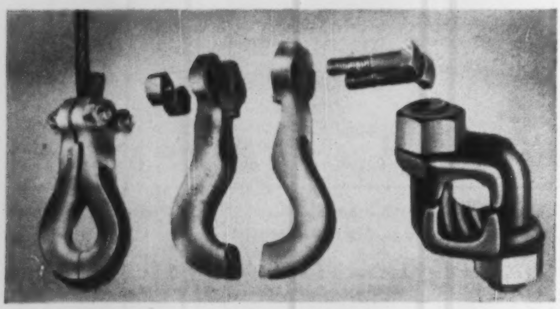
From the experimental data this developed, the following table on sheave diameter factors is introduced as a preliminary guide in selecting the proper sheave size. It lists the general purpose range on the more commonly used rope constructions based primarily upon bending stresses. If it becomes expedient to go either above or below the general range, plotted curves will be supplied by Union Wire Rope engineers for determining the change in service life due to bending fatigue.



SHEAVE DIAMETER FACTORS

Rope Construction	Higher Range	General Purpose Range D/d Ratios		Lower Range
6x7	For example: Shaft hoists would require higher values	63	42	For example: Truck winch would require lower values
18x7		54	36	
6x17 Seale		49	33	
6x19 Seale		45	30	
6x21 Filler Wire		39	26	
6x25 Filler Wire		36	24	
6x31		33	22	
8x19 Seale		31	21	
6x37		27	18	
8x19 Warrington		27	18	
Tiller Rope		18	12	

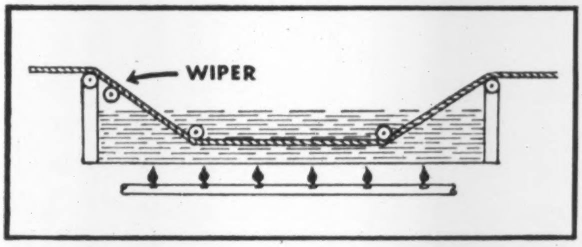
To determine sheave diameter multiply higher or lower range values above by the rope diameter.

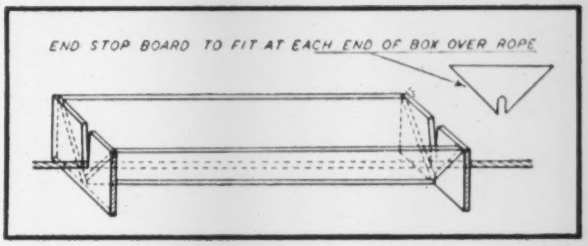


Attach By Clipping

The fittings you use on wire rope can handicap it or enable it to work at full efficiency. Fittings which derive holding power by crimping action are harmful to the rope. Shown here are two rope clamps. One is a combination clamp and thimble. Both provide snug saddling of the rope and grip larger and uncrimped bearing surfaces so tightly that the loads are carried almost solely by the force of friction.

To More Than Break Even In Service Life Give Your WIRE ROPE An Even Break

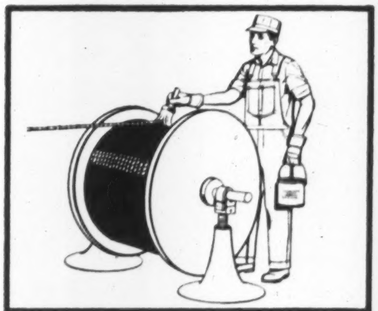


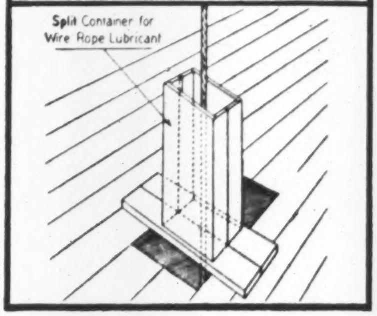


Rope That Is Stored for long periods of time should be lubricated during installation. If it is not possible to lubricate stored rope very often, apply a sealing compound to hold the lubricant that is already present.

Rope In Use can be lubricated most economically without removing it from the equipment on which it is operated. Lubricate rope as often as it needs it—service conditions determine the frequency.

Use Lubricant Hot or Cold, depending on its penetrating qualities. Your local oil company engineer will be able to recommend an oil that will actually penetrate to the working parts of the rope, and not just form a coating that peels off the first time your rope runs through a sheave.

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Mount a reel on your scraper and move more yardage per foot. Flexible to resist sharp bends, stiff enough to resist looping and kinking.

Tuffy **Slings & Hoist Line**

A hoist line that gives you extra service life. Slings of 9-part machine braided wire fabric fight kinking — a matched team of balanced performers.

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Rides smooth on drums and hugs the drum when casting. Extra flexible, yet constructed to give maximum abrasive resistance.

Tuffy **Dozer Rope**

Mounted on special 150′ reel that lets you use rope you now throw away! Increases service life and reduces down-time. 1/2″ and 9/16″.

Your Union Wire Rope Distributor Is Good At Solving

Wire Rope **Riddles.** When you have a wire rope problem, give your Union Wire Rope distributor a call for hurry-up service. Chances are you'll find he has the correct answer at hand—because part of his job is figuring out how your equipment can give you the best operation, at the lowest operating cost! Feel free to call on him anytime.

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Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

Whether used as a porous or impervious concrete, as a sprayed-on membrane, or in prefabricated panels . . .

Asphalt Has Many Uses On California

Louis R. Hovater
Area Engineer, The Asphalt Institute

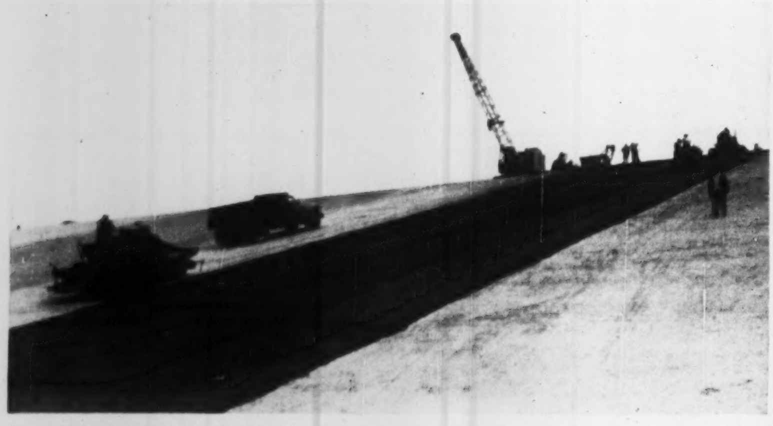
Asphalt in various forms is finding increased use in lining water supply reservoirs of California. As membrane and prefabricated panels, it is made into watertight linings. And as asphaltic concrete, it is cast as either impermeable or porous linings.

Imaginative California engineers have experimented for many years with various types of alphaltic linings for reservoirs. First attempts involved use of road oils mixed in place with local aggregate. Now, numerous reservoirs of multi-million gallon capacities utilize one or more of the three basic linings: asphaltic concrete, asphaltic membrane and prefabricated asphalt-panels.

I. Asphaltic concrete

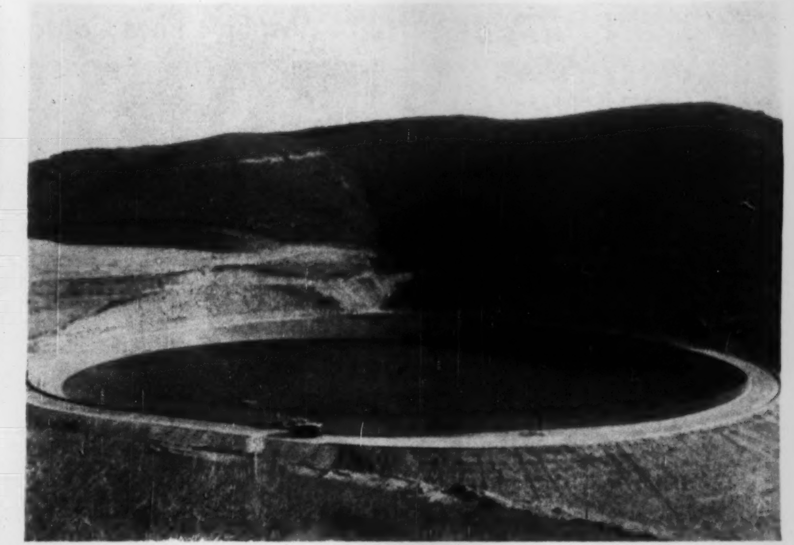
Asphaltic concrete plays a dual roll in the design of hydraulic structures; It serves either as an impermeable, watertight lining or as a porous lining. Where used as an exposed porous lining, an underlying blanket of earth, or some other type of seal, provides imperviousness. Use of a porous asphaltic concrete lining relieves uplift pressures and prevents upheaval of the lining on drawndown of water level by allowing water in the bank to seep harmlessly back into the reservoir.

The principal function of porous asphaltic concrete is to prevent erosion



1. ASPHALTIC CONCRETE, 3 in. thick, was laid at Garvey with conventional paving equipment. Impermeable earth beneath asphalt makes reservoir watertight.

2. MEMBRANE LINING on 5-mg La-Habra reservoir is $\frac{3}{8}$-in. thick. Asphaltic



RESERVOIRS, BOTH BIG AND SMALL, have asphalt linings. Garvey Reservoir (left) has 1,500 acre-ft capacity; Green Verdugo Reservoir (above) holds only 99 acre-ft.

Reservoirs

and provide a working surface for cleaning and maintenance operations. But it is sometimes used as a buried porous layer to serve as a drainage course to control seepage losses.

Composition of asphaltic concrete is different for the two separate functions. A porous mix should have more larger-size aggregates. And it need not have as much asphalt. An impermeable mix must be rich in asphalt and as dense as possible.

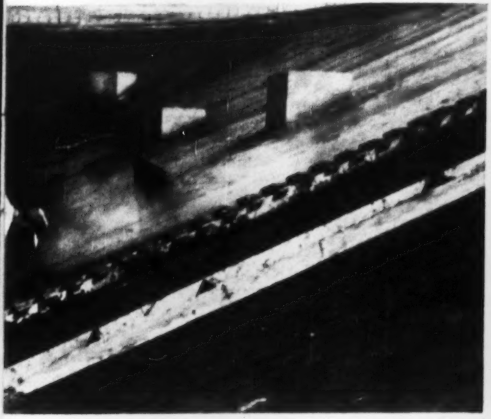
The following table gives the most commonly used gradations of the aggregate for either type of lining:

Sieve Size	Porous % Passing	Impermeable
¾″	95-100	. . . . .
½″	85-95	. . . . .
⅜″	. . . . .	100
No. 4	44-56	90-97
No. 10	25-35	65-80
No. 40	10-18	34-45
No. 80	3-9	22-30
No. 200	1-4	10-16
Asphalt	5-6%	8-10%

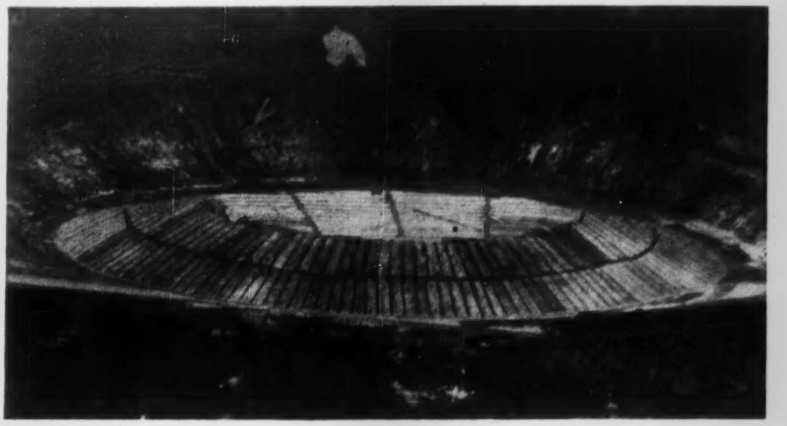
Asphaltic concrete for lining hydraulic structures must be tough, durable and resistant to erosion. The mix should contain as high a percentage of the harder grades of asphalt cement as possible. In reservoir linings, rich asphaltic mixtures may be used with confidence because the lining will generally not be subjected to heavy concentrated loads. However, the lining must resist plastic flow down the bank under the sustained force of its own weight. Asphalts in the 50-70 penetration range are recommended for this purpose.

Linings with hard asphalts are also more resistant to the destructive actions of water and vegetation. But, if there is any doubt as to the sterility of the soil over which an asphalt lining is to be placed, some form of weed control is recommended. Soil sterilants should, of course, be nonpoisonous to human and animal life. Various commercial compounds such as Polybor-Chlorate and Borascu are used for this purpose.

• Standard spreader used—The asphaltic concrete is prepared as a hot-mix in an asphalt plant, hauled to the



prime coat forms base; portland cement concrete will form protective cover.



3. ASPHALT PANELS lining 1-mg Redding reservoir are ½ in. thick, 4 ft long and 22 in. wide. Hot asphalt seals joints between panels.

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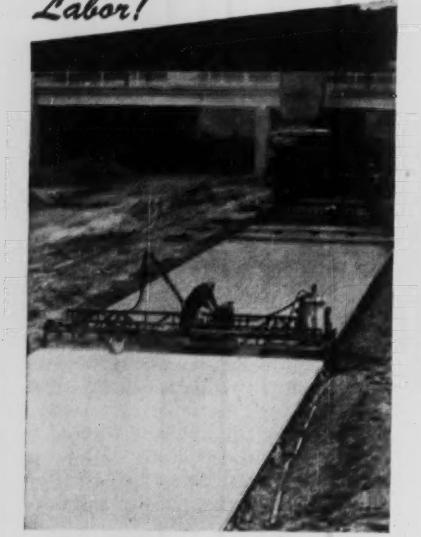
. Saves Time and Labor!



THIS CONCRETE WILL BE *STRONG* and *DENSE*. TRUSCON "TRU-CURE" PREVENTS EXCESSIVE MOISTURE LOSS IN THE EARLY STAGES OF CURING

Truscon "Tru-Cure" is a liquid curing compound for concrete. It permits *proper* curing by preventing moisture loss especially in the early hours immediately following the pouring of concrete. This is the real *danger* period when heat or air movement causes too-rapid evaporation, resulting in surface shrinkage and "checking."

You'll Profit From These Advantages, Too . . .

- Saves clean-up after curing is done
- "Cures" at lowest cost per yard
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- Eliminates quick break-off of curing and sudden drying-out of surface

Available in clear or light-reflecting pigmented types. Meets state and other governmental specifications.

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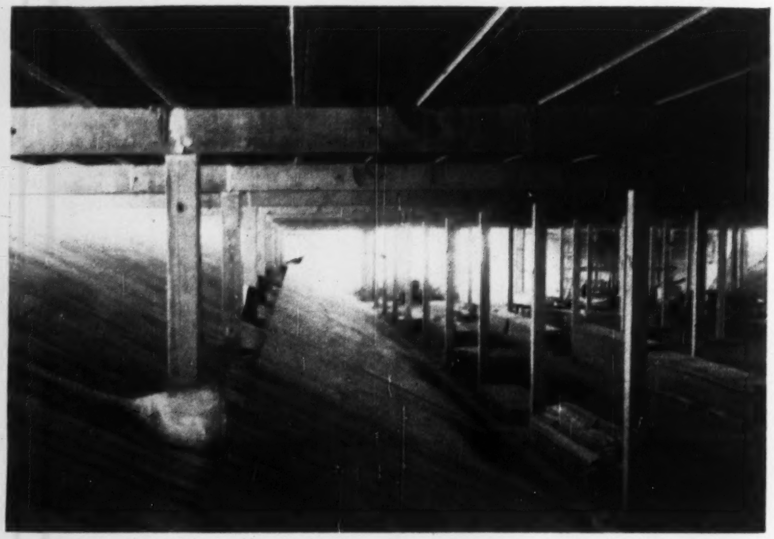


ANOTHER PANEL-LINED JOB is covered clear-water reservoir at El Cerrito.

job, spread and compacted on a prepared subgrade by machines. Usually the machines are custom built for a particular job, especially for paving of reservoir slopes. At the Garvey Reservoir in Monterey Park, Calif., however, the paving contractor used a standard mechanical spreader on the reservoir side slopes. Use of this machine assured an even spread of the asphaltic concrete, increasing the quality of the work and the quantity of lining placed during a work day.

The 1,500-acre-ft Garvey Reservoir is a facility of the Metropolitan Water District of Southern California. Design of the lining follows practice development by the Los Angeles Department of Water and Power. Almost without exception this design calls for an asphaltic concrete mixture consisting of a hard asphalt cement and a specially graded aggregate to provide porosity—both materials similar to that previously mentioned for porous linings. An underlying impermeable blanket of earth makes the reservoir watertight, and a 3-in.-thick asphaltic concrete lining provides a defense against erosion. A sprayed coating protects the surface of the asphaltic concrete from the damaging effects of surface tension caused by repeated wetting and drying of clay, silt, algae, etc. The coating is a thin spray of neat portland cement mixed with 10 gal of water per sack and 8% by weight of calcium chloride. It is applied at the rate of about 600 sq ft of lining per sack of cement.

II. Asphalt Membrane Linings

The asphaltic membrane type of lining consists of a thin sprayed-on layer of asphalt (containing no filler or reinforcing of any nature) covered by some other erosion-resistant and protective material. The primary concern in constructing this lining is to obtain a sufficiently thick, continuous asphalt film to provide a completely watertight membrane. The amount of asphalt used will vary with the texture of the material on which it is sprayed—usually 1.5 to 2 gal per sq yd.

Asphaltic material used for membranes must be tough enough to withstand mutilation during placement. And it must be sufficiently pliable and plastic to conform readily to any changes in cross-section of the base course materials or subgrade.

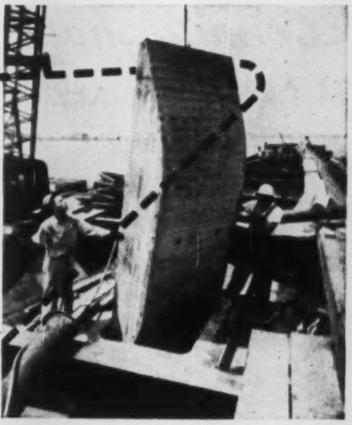
• Developed as canal lining—The Bureau of Reclamation, in working with buried asphaltic membrane canal linings (ENR Feb. 28, 1952, p. 39), has developed specifications for a modified asphalt that fit these requirements. In brief, the material has these properties: flash point (Cleveland open cup) not less than 425 F; softening point (ring and ball) between 175 and 200 F; 50-60 penetration at 77 F (100 g, 5 sec); not less than 30 penetration at 32 F (200 g, 60 sec); not more than 3.5 cm penetration at 115 F (50 g, 5 sec); loss at 325 F not more than 1.0% in 5 hr; penetration of residue at 77 F (100 g, 5 sec) not less than 60% of penetration before heating; and bitumen soluble in carbon tetrachloride not less than 97%. The USBR specifications call for use of various ASTM test methods in judging ability of the asphalt to meet these requirements.

(Continued on page 54)

Like passing a camel through a needle's eye!

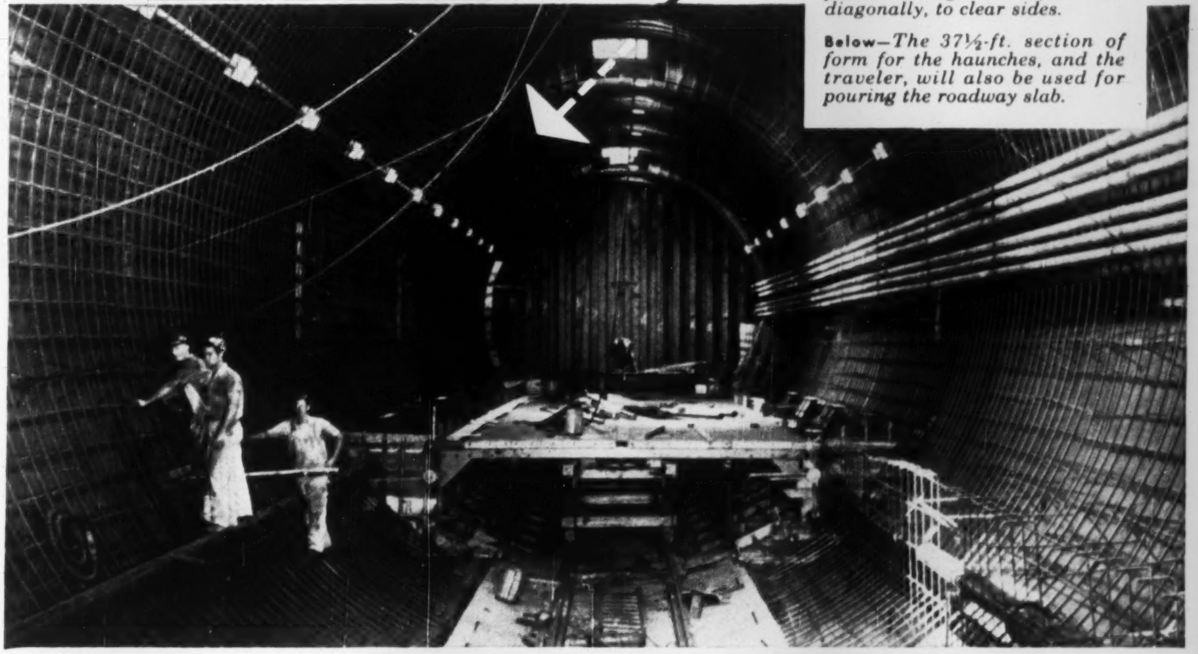
BLAW-KNOX STEEL FORMS

for a 300-ft. long by 30-ft. diameter tunnel tube section pass through a 6-ft. by 4-ft. hole!



Above—*Blaw-Knox sidewall form passes through 6 x 4-ft. hatch diagonally, to clear sides.*

Below—*The 37½-ft. section of form for the haunches, and the traveler, will also be used for pouring the roadway slab.*



● It sounds impossible, but Blaw-Knox engineers did it! For the Hampton Roads Tunnel, a job involving 5 pour lifts on the river surface, then sinking 23 tube sections into a prepared trench, a unique Blaw-Knox form design permits passing two complete 150-ft. sets of forms through a 6 x 4-ft. hatch opening.

Three other major problems were solved by Blaw-Knox simplified forming methods. During the placing while the tube shell floats on the surface, flotational stability is maintained to prevent capsizing. The job moves like clockwork, with no unnecessary delays for setting or stripping forms or waiting for pours to cure. A better bond for tiling the tube sidewalls is obtained by welding scoring wires to the forms.

These time and money-saving steps are expected to knock several months off scheduled time.

Write for a free copy of the reprint entitled "Linked Car Floats Quickly Sink Tunnel Tubes" giving a vivid story of the Hampton Tunnels job.

WHEN *YOU* HAVE A DIFFICULT CONCRETING PROBLEM, take advantage of the Blaw-Knox Steel Forms Consultation Service in the preliminary planning stage. Blaw-Knox engineers have solved similar problems and saved money for other contractors. There's no substitute for Blaw-Knox years of practical experience. Call, wire or write Blaw-Knox today.

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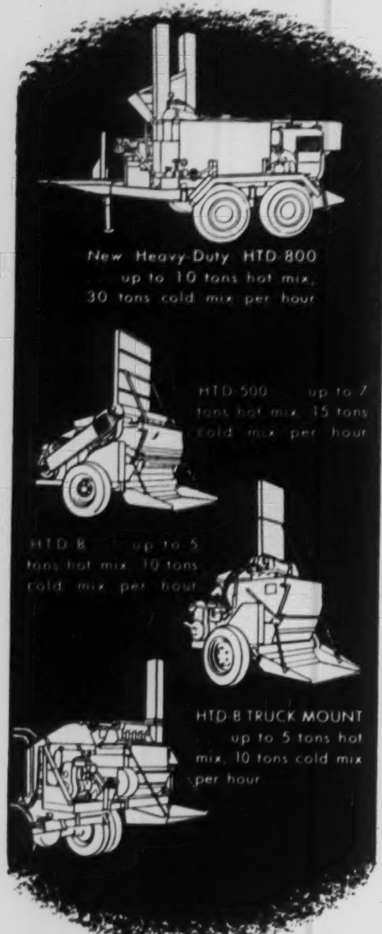
McConnaughay
HOT ASPHALT MIXERS


New Heavy-Duty HTD-800 . . . up to 10 tons hot mix, 30 tons cold mix per hour
HTD-500 . . . up to 7 tons hot mix, 15 tons cold mix per hour
HTD-B . . . up to 5 tons hot mix, 10 tons cold mix per hour
HTD-B TRUCK MOUNT . . . up to 5 tons hot mix, 10 tons cold mix per hour

. . . for resurfacing and patching in any season

Designed for economy of operation and fast production, the McConnaughay line of Asphalt Mixers meets every need for most resurfacing as well as all types of pavement patching. Working on location, McConnaughay HTD Mixers provide the *exact amounts* of materials needed and effectively remove both moisture and solvents from bituminous mixtures. . . positive assurance that patches and resurfaced areas will set up hard. For details and specifications on the mixers above and on the JR and HTD-LP models (not illustrated), write, wire or 'phone . . .

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Asphaltic Concrete on Los Angeles Department of Water and Power Reservoirs

Name	Date Const.	Capacity (acre-ft)	Side Slopes				Bottom		
			Lining	Slope	Thickness (in.)	Area (sq ft)	Lining	Thickness (in.)	Area (sq ft)
Upper San Fernando	1940-41	1848	AC	2:1	3 & 4	250,000 60,000	None	None	......
DeSoto St.	1941	9.4	AC	1-1/2:1 1-3/4:1	4	35,000	AC	4	24,000
Rowena	1942	96	AC	1-1/2:1 2-1/2:1	4	68,000	AC	4	22,000
Elysian	Enlarged 1943	168	AC	2:1 3:1	3	276,000	AC	3	57,000
Baldwin Hills	1951	897	AC	2:1 2-1/2:1	3	468,000	AC	3	416,000
Ivanhoe	1952	213	AC	2:1	3	165,000	AC	3	222,000
Eagle Rock	1953	257	AC	2:1	3	260,000	AC	3	101,000
Green Verdugo	1953	99	AC	2:1	3	150,000	AC	3	40,000
Upper Stone Canyon	1954	482	AC	2:1	3	450,000	None	None	......
Silver Lake	1954	2045	AC	3:1 2:1	3	732,000	None	None	......
Lower Stone Canyon	1956	9752	AC	3:1 2:1	3	440,000	None	None	......

Protective covering and base-course materials range from earth, sand or gravel to asphaltic concrete, portland cement concrete or portland cement gunite. If of earth, sand or gravel, the protective covering above the membrane may vary from 1 to 3 ft in thickness, depending upon the type of cover and operating conditions. Where used in conjunction with asphaltic concrete, portland cement concrete or portland cement gunite, the membrane is usually sprayed between layers of these materials.

An example of membrane lining is a 4-mg reservoir recently constructed by the City of Whittier, Calif. The lining consists of an asphalt (MC-1) stabilized base topped with 2 gal per sq yd of asphalt membrane that acts as a sealer. The exposed lining is 5 in. of reinforced portland cement concrete on the bottom and 3 in. of reinforced portland cement gunite on the sides.

A similar 5-mg reservoir was built for the City of La Habra, Calif. The lining consists in part of an RC-1 prime coat on a compacted subgrade topped by a ⅜-in. thick asphalt membrane. The exposed lining is reinforced portland cement concrete on the bottom and gunite on the sides.

• Combined linings—Other reservoirs combine asphaltic concrete and asphaltic membrane linings. For example, the present standard design of the East Bay Municipal Utility District consists of a porous rock base layer, topped by a layer of dense-graded asphaltic concrete, covered with an asphaltic membrane and surfaced with reinforced portland cement concrete. The porous rock acts as a drainage channel. The asphaltic concrete provides support for the membrane. The membrane provides watertightness. And the portland cement concrete gives a working surface and acts as a protective covering for the membrane. All EBMUD reservoirs are covered.

An unusual instance of asphaltic concrete and asphaltic membrane is Los Angeles' Baldwin Hills Reservoir. Because of certain geological conditions, elaborate planning—resulting in uncommon design—was necessary to guard the installation against leakage. The lining consists of four separate units: a membrane seal, a porous drainage course, a compacted earth blanket and a layer of asphaltic concrete.

Prior to the placement of the membrane seal, a prime coat of several applications of light, slow-curing asphalts was sprayed over the subgrade. The seal consisted of two or three applications of 40-50 paving grade asphalt. A 5-oz cotton fabric reinforced the slide slope membrane.

The compacted dense earth blanket ranged in thickness from 5 ft at the top of the slope to 15 ft at the bottom, with 10 ft of blanket over the entire floor. The exposed portion of the lining was an asphaltic concrete layer 3 in. thick.

III. Prefabricated Linings

In general, prefabricated asphalt panels or reinforced, molded asphalt panels consist of impermeable asphaltic mixes or mastics applied to various backing materials. Panels are manufactured at a central plant and transported as a finished product to the reservoir. They are remarkably strong and flexible, insuring ease of placing.

Panels are made in various thicknesses, lengths and widths, but ½ in.

Board of Education maintenance engineers in one of the Nation's largest cities have coated this and thirty others of the school system's 300 buildings with above-grade masonry water repellent made with UNION CARBIDE Silicones. New schools are being treated as erected. In the school shown above, leaks were serious, so brick was repointed before treatment. Result: No more moisture problems.

Masonry needs moisture protection, too

Remove a duck's "moisture protection" and it will drown. Let water penetrate a masonry wall and it will cause untold damage.

Now a remarkable above-grade masonry water repellent made with UNION CARBIDE C-25 Silicone keeps water out of buildings. Architects, builders and masonry contractors today widely specify this "invisible raincoat." It goes on easily, leaves no visible trace after drying, and it lasts for years and years.

Original building beauty is maintained. The danger of cracks and spalling due to freezing is removed. Because silicones penetrate and line but do not seal masonry pores, the walls can still "breathe." Staining due to efflorescence is checked. Rain simply washes dirt and dust to the ground. And interior water damage to wood, plaster, and decorating is eliminated. It works just as well on old buildings as new.

There are suppliers of masonry water repellents made with UNION CARBIDE Silicones near you. For a representative list, write to Dept. NR-61.

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. . . Asphalt linings

is a frequently used thickness. As a rule, wider and longer panels are the most economical since joint sealing is minimized. Both lapped and butt joints are employed, with a hot asphalt or cold-applied asphalt-mastic as the joint sealer.

Panels are laid directly upon a prepared earth subgrade or upon a base material which may be asphaltic concrete, portland cement concrete or portland cement gunite. This type of lining offers an excellent, economical method of sealing existing linings.

A prefabricated asphalt panel lining was recently installed on a prepared earth subgrade of a 1,000,000-gal reservoir for the City of Redding, Cal. Circular in form, the reservoir was shaped above ground from locally available materials. The panels were ½ in. thick, 4 ft wide and up to 22 ft long. Both lap and butt joints were used with a hot asphalt joint sealer.

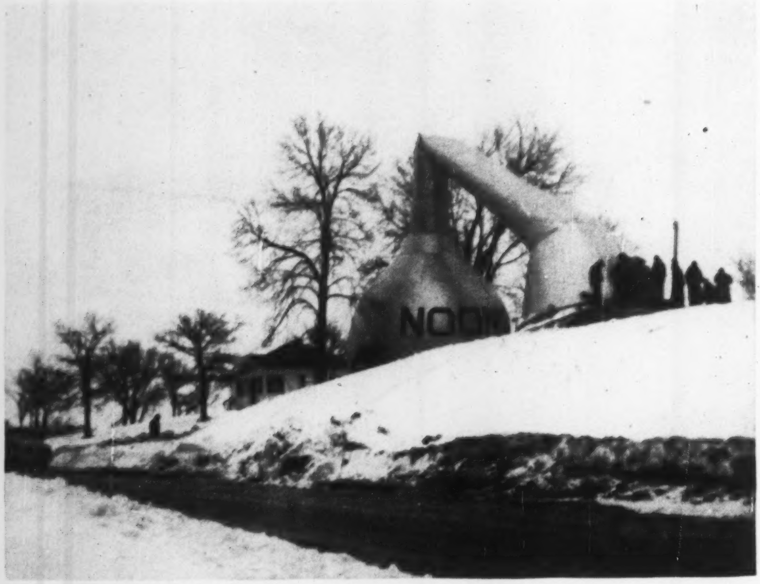
The East Bay Municipal Utility District recently relined the 6-mg San Pablo Clear Water Reservoir in El Cerrito, Calif. (ENR Oct. 13, 1955, p. 33). This covered reservoir had a rigid-type lining that was leaking badly. By the use of ½-in.-thick prefabricated asphalt panels (up to 25 ft in length) and mastic joint sealer applied cold, the reservoir was relined.

Lights Will Control Traffic In Reversible Tunnel Tubes

Plans for a new traffic signal system to facilitate orderly reversal of direction of traffic in one or both lanes of any of the three tubes of New York's Lincoln Tunnel, was announced last week by the Port of New York Authority.

The awards were made in anticipation of the completion in 1957 of the third tube of the facility, now under construction (ENR Jan. 19, 1956, p. 46). When the third tube is completed, it is contemplated that the present south tube—which will become the center tube—will be reversed to carry traffic either from the New Jersey side of the Hudson River to New York, or from New York to New Jersey, depending on peak loads.

The lighting installation will comprise dual red, amber and green lights spaced at 240-ft intervals at ceiling level over the center of each of the six lanes that the tunnel will contain. The contract, awarded on a cost-plus basis estimated at $384,000, was an addition to the original contract for electrical work awarded last September to a joint venture of Lightning Electric Service Co. of Newark, and Fischbach and Moore, Inc. of New York City.



Toppled Tank Found Undermined

Now that the frost has gone out of the ground, investigations have been made and have shown there was nothing wrong with design or construction of a 50,000-gal Watersphere that fell in February in New London, Minn.

The trouble, investigators found, was that a trench had been dug within 5 ft of the foundation last fall when the tank was only 19 months in use. A water service line was installed; the trench was filled; and five months later, down came the tank.

Investigations have been made by Hitchcock & Estabrook, Inc., Minneapolis consulting firm, and by Chicago Bridge & Iron Co., erectors of the elevated storage tank.

"Upon completion of the investigation, Chicago Bridge & Iron Co. has been completely absolved of all responsibility for the failure," says Lester Lee, president of Hitchcock & Estabrook. "As a gesture of good will and sound public relations—even though the guarantee period has expired—the Chicago Bridge & Iron Co. has voluntarily agreed to erect a new Watersphere for the Village of New London, at no cost to the village," Mr. Lee reports.

As to why the tank fell, Mr. Lee told ENR:

"We found that a water service connection had been installed to a nearby house late in the fall of 1955. We excavated down to this service line and found that at one point the pipe was within 5 ft of the footings. We do not know the width of the trench, but without question the ground was opened something less than 5 ft away from the footing. The soil at that point is extremely fine sand, probably passing a 100-mesh sieve.

"While it perhaps would be difficult to prove from a legal point of view that the trench caused the failure, careful investigation on the part of our firm, as well as the engineers of the Chicago Bridge & Iron Co., discloses no other probable cause. Footings were down 8½ ft and carried a load of less than 3,000 psf, plus wind pressure. At the time of the failure there was practically no wind. With a wind of 100 mph the total load would still be less than 4,000 psf. The fact should be noted that the concrete footings are not cracked at any place."

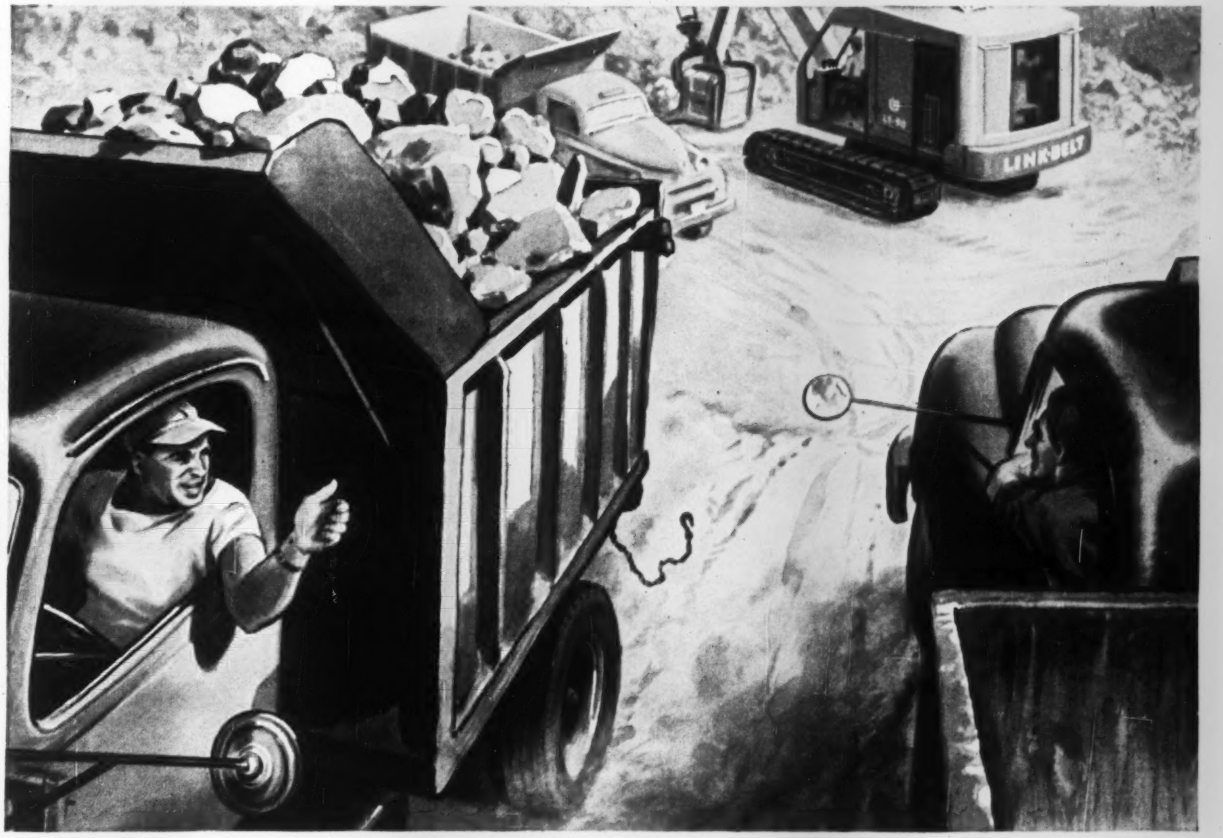
The edge of the footing nearest the trench settled about 6 in. while the edge furthest away raised about 2½ ft. It is probable that the trench bottom was about 2 ft below the bottom of the footing.

The tank had been built for $28,000, including the cost of footings. It was supported on a ring wall, which in turn was on a solid concrete slab.

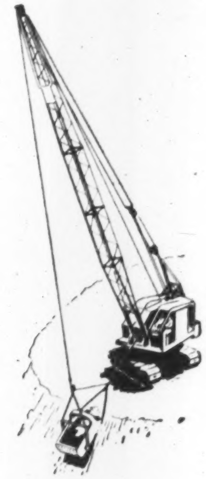
The collapsed 20-ft dia tank, its shaft and frustum are good only for scrap now.

A Watersphere of the same capacity, on the same type of foundation, will be built by CB&I at a site to be selected by the village. It should be in service about next Nov. 1. Meanwhile, New London, a village of 800 people, 120 mi southwest of Minneapolis, is pumping water from a nearby lake.

It's time to compare... with LINK-BELT SPEEDER



"First time a shovel has kept us rolling like this!"



Shovel-Crane owners:

New Link-Belt Speeder performance is so outstanding, it has completely revised existing production standards . . .

With competition getting rougher, can you afford to think in terms of outdated production standards? If you aren't using a Link-Belt Speeder or haven't seen one in action recently—it's hard to realize just how much more production . . . more usable net horsepower these new shovels, cranes and hoes offer.

Speed-o-Matic power hydraulic controls—a Link-Belt Speeder exclusive—make every move fast, sure, easy. With them, you can boost output—often as much as 25% or more!

From track treads to boom tip

. . . every detail of a Link-Belt Speeder reflects advanced engineering, skilled craftsmanship, precision construction and quality materials.

And look at this list of standard and optional features — independent swing and travel . . . independent rapid boomhoist . . . torque converter . . . third drum . . . reversing clutches for both hoist drums . . . and power hydraulic-actuated swing brake, to mention only a few.

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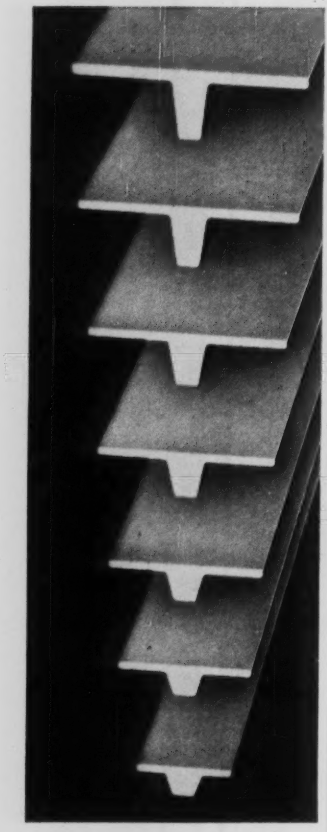
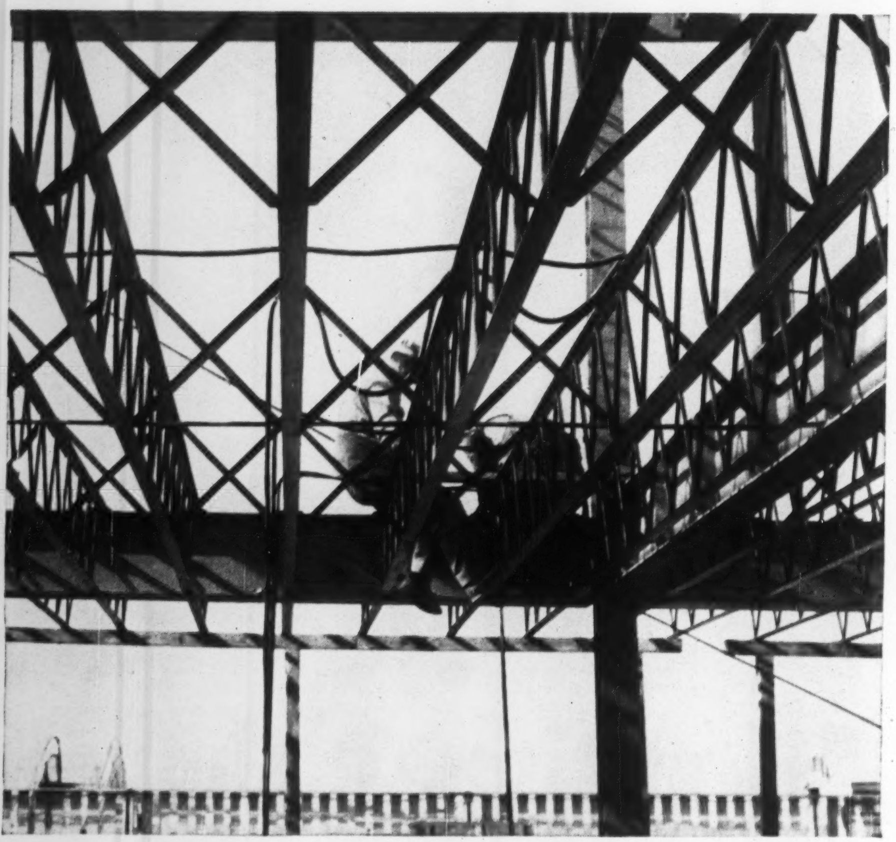
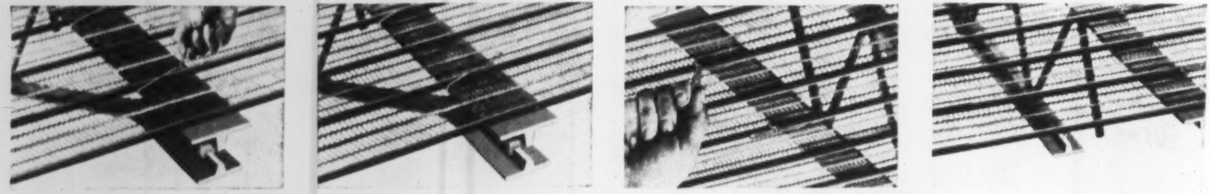
TRUSCON SOLID CHORD







STRONG, FIRE-RESISTANT CONSTRUCTION is provided by attaching Truscon metal lath directly to O-T or Clerespan Steel Joists as a base for plaster. Through the use of special lath clips, permanent fastening to top or bottom chord is easy and quick . . . requires no special tools. When metal lath is used to support concrete top slab and plaster ceiling, a high degree of fire resistance results through the complete absence of combustible materials.

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World's Widest Range of Standard Steels

DESIGN PROVIDES GREATER LATERAL STRENGTH AND RIGIDITY

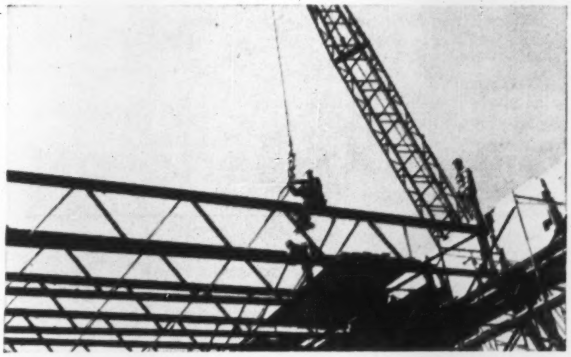
Steel joist construction is expanding to greater limits. To meet your requirements, Republic's Truscon® Steel Division offers a complete series of solid, hot rolled, tee-shaped chord members for use in O-T® (Shortspan) Open Truss Steel Joists.

These chord sections are scientifically designed to provide the proper width, depth and strength to match desired span and load. In addition, the greater flange width of these solid members provides both improved lateral stiffness and increased bearing area. Finally, both top and bottom chords are continuous from bearing to bearing, and webs are uniform in diameter. All components are joined by resistance welding to assure uniform strength and rigidity throughout each joist.

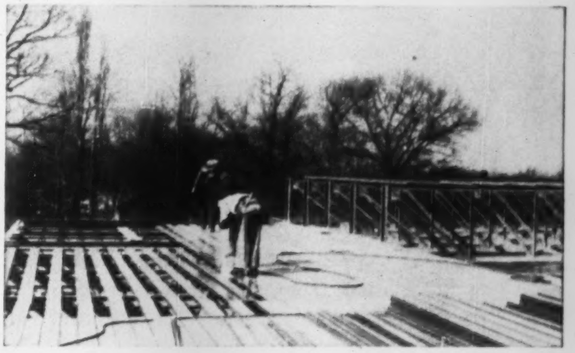
The Steel Joist Institute, of which Truscon is a member, has contracted recently with an independent and nationally accredited Inspection Laboratory to perform periodic unscheduled inspections of joist fabrication at each plant of each member company. Inspections will be made for dimensional tolerance, panel spacing, eccentricity of joints and alignment of bearing members. Tests will be made to determine the quality of steel. Adding to this, the established advantages of the Truscon Institute-approved steel joists, you are doubly assured of steel joist construction that will meet every conceivable requirement.

Floors of steel joist construction can be made fire, vermin and sound resistant through proper application of a reinforced concrete slab floor, plus a metal lath and plaster ceiling. In addition, this construction is ideally adapted to piping and conduit runs in any direction within the floor.

It will pay you to get complete details on Truscon O-T Open Truss Steel Joists with solid chord sections. Simply contact your local Truscon representative or mail the coupon for booklet E-290 today.



FOR STRENGTH IN LONGER SPANS, Truscon's Clerespan® Steel Joists are the ideal answer. Using this strong but light Warren type truss, floors up to 96 feet in width can be kept entirely free of intermediate supports. And this maximum span joist measures only 48 inches in depth . . . minimizing required wall height. Booklet E-290 contains a complete Standard Loading Table for Truscon Clerespan Steel Joists. Just mail the coupon for your copy.



COMBINING STRENGTH WITH EASE OF INSTALLATION, Truscon Ferrobord® Steeldeck is the ideal roofing to use with steel joist construction. Clipped or welded directly to the steel joists, large areas . . . flat, pitched or curved . . . can be roofed over quickly from the top. No scaffolding is required. Ferrobord comes in lengths long enough to span three or more purlins. Truscon's exclusive design is fully interlocking throughout each length to provide strong, tight joints.

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and Steel Products

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3114 East 45th Street
Cleveland 27, Ohio

Please send me further information on the products checked below:
- ☐ O-T Steel Joists, Booklet E-290
- ☐ Clerespan Steel Joists
- ☐ Truscon Metal Lath
- ☐ Truscon Ferrobord Steeldeck

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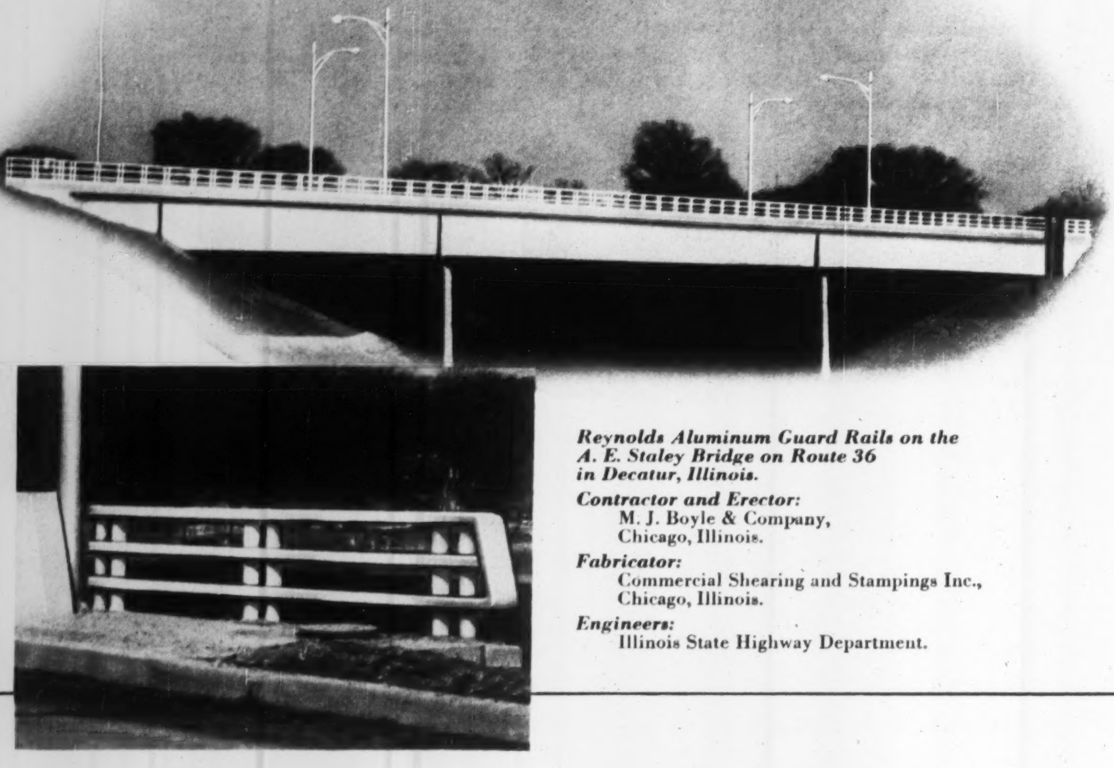
K 9922

THE MODERN PATTERN IN RAILINGS AND LIGHTING STANDARDS...

aluminum



Reynolds Aluminum Guard Rails on the A. E. Staley Bridge on Route 36 in Decatur, Illinois.

Contractor and Erector:
M. J. Boyle & Company,
Chicago, Illinois.

Fabricator:
Commercial Shearing and Stampings Inc.,
Chicago, Illinois.

Engineers:
Illinois State Highway Department.

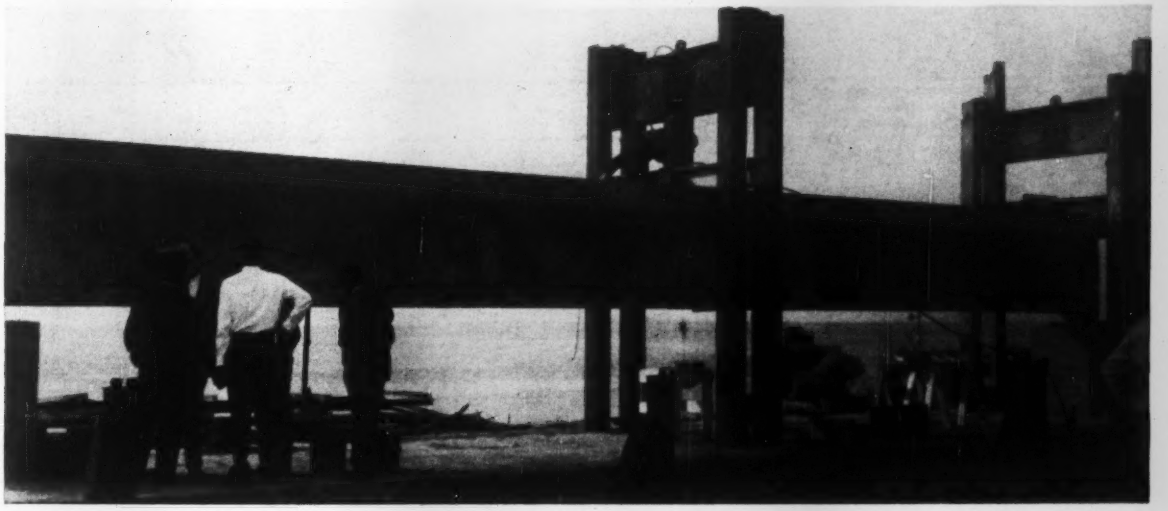
On more and more bridges and viaducts across the country, guard rails and lighting standards attest the beauty of modern design with aluminum. The pattern has become traditional... aluminum for strength, for rustproof permanence without painting, for lower installed cost due to lighter weight and better workability.

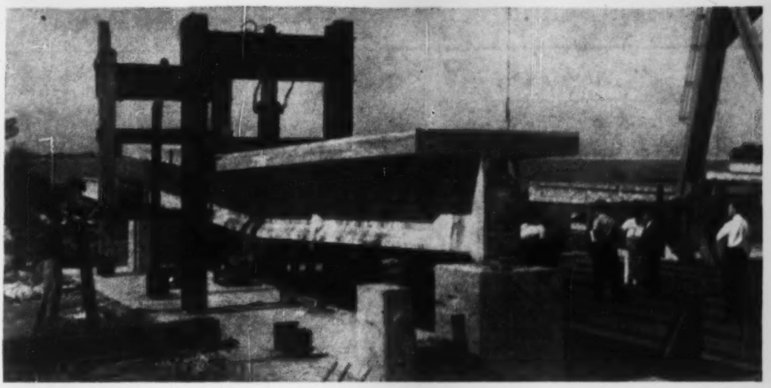
In the example shown here, railings and posts are specially cast aluminum. Many other guard rails use standard shapes and tubings. Illustrated booklet on request. For either standard mill products or for special requirements, call the nearest Reynolds Office listed under "Aluminum" in classified directories. Or write to **Reynolds Metals Company,** General Sales Office, Louisville 1, Kentucky.

For quick reference, see catalog $\frac{5a}{Re}$ *in Sweet's Architectural File.*

REYNOLDS ALUMINUM

See "FRONTIER", Reynolds great dramatic series, Sundays, NBC-TV Network.





By testing to failure this precast, prestressed concrete beam with cast-in-place slab as top flange, researchers learned that . . .

No Shear Keys Are Needed Here

W. E. Dean
Bridge Engineer
State Road Department
Tallahasse, Fla.

A. M. Ozell
Associate Professor
Department of Civil Engineering
University of Florida

In composite concrete beam and slab construction, are keys necessary to resist the horizontal shear between beam and slab?

This is the question we put to the test in the casting yard of Hardaway Contracting Co., Tampa, Fla. Our specimen was a full-size, 46-ft precast, post-tensioned girder of the type used in the 2½-mi Gandy Bridge across Tampa Bay. Shear keys were omitted between the beam and cast-in-place top slab. In fact, the top surface of the beam was wood-float finished to produce little resistance to slip.

Simply supported at its ends, the test beam was subjected to two loading conditions. The first was for maximum shear, with the load placed close to the support—about 24 in. from the end reaction. For the second condition, maximum moment, the load was placed at midspan.

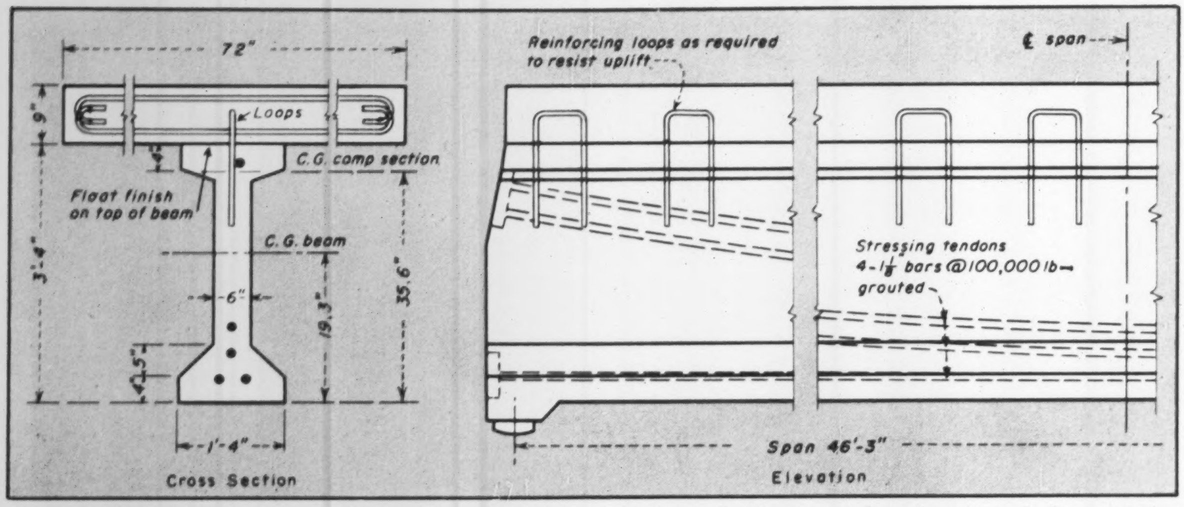
Loads were applied by a 200-ton, 12-in. stroke hydraulic jack and transmitted to the beam via a 10-in. H-beam that distributed the force over the tee section.

Results of the tests showed:

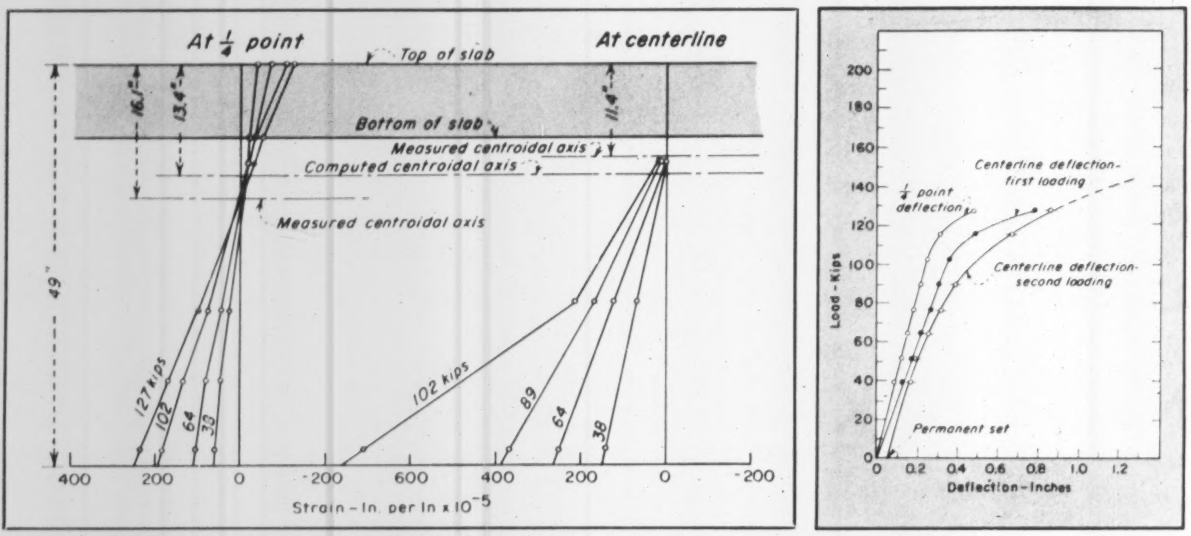
- Over-load properties of the beam were safely above design calculations.
- At no point during the test did the slightest sign of trouble show at the junction between beam and slab.
- For this member, with tie-down steel proportioned as it was, it appeared that a load that will destroy the member in bending would not produce differential sliding between elements.
- With ordinary rough floating and removal of laitance at the joint, and with the two elements' securely tied together vertically, the bond developed between concrete surfaces was found to be of the order of that between concrete and bars.

These results verified our physical picture of what would occur. At the plane of contact between beam and slab, the resultant shearing force is always inclined, and this shearing force has equal horizontal and vertical components. Without any form of keys or reinforcement, the natural bond of the concrete at the joint should provide a large and dependable resistance to horizontal force alone, but a lesser—and undependable—resistance to vertical force. This being the case, it seems that usual specifications for composite design overemphasize the horizontal shearing force and underplay the vertical.

From this, it can be seen that sufficient reinforcing steel should be extended into the slab to develop the full vertical component. Using the


72"
9"
Loops
C.G. comp section
Float finish on top of beam
C.G. beam
3'-4"
6"
19.3"
35.6"
4.5"
1'-4"
Cross Section
Reinforcing loops as required to resist uplift
℄ span
Stressing tendons 4-1⅛ bars @100,000 lb—grouted
Span 46'-3"
Elevation

PRESTRESSED T-BEAM with no shear keys between separately cast stem and slab was tested to determine whether composite action was developed without keys. It has section properties almost identical to those of Gandy Bridge girders.



STRAIN DISTRIBUTION (left) shows centroidal axis near location computed for composite action. Load-deflection curves (right) indicate girder behaves almost the same after cracking as before. Data is for loads applied at midspan.

usual nomenclature, this vertical force would be VQ/I less the weight of the slab. With this amount of steel resisting vertical separation, it is difficult to imagine horizonal movement between the two elements.

• How tests were made—On the date of testing, the concrete in the beam was 33 days old, and cylinder tests indicated a strength of 6,200 psi. Concrete in the slab was 21 days old, with a cylinder strength of 4,810 psi.

On the beam, eleven strain-gage lines were placed at the quarter point, and three at midspan. Strain-gage holes were drilled into the concrete, and steel inserts, ¼ in. in dia, ⅜ in. long, were grouted in. Strain measurements were made with a 10-in. mechanical strain gage.

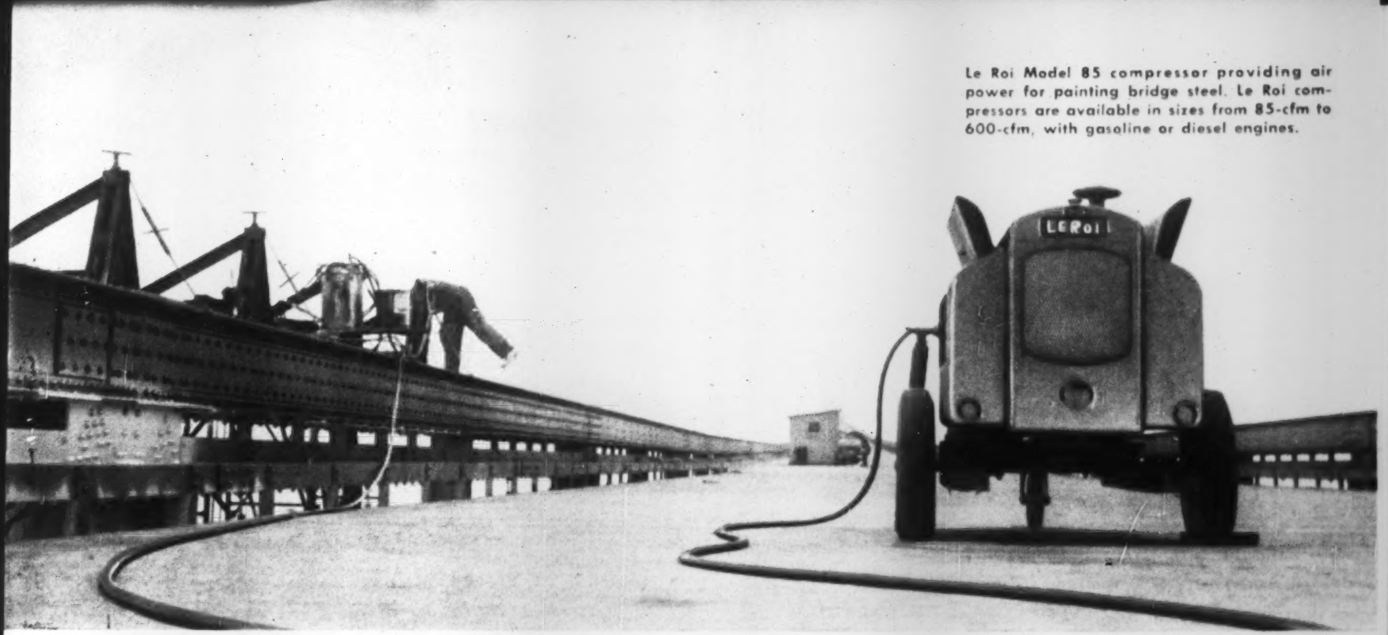
The equivalent concentrated load to produce the same maximum shear as an H-20 live load plus 30% impact was 53,000 lb. To produce maximum shear, the load was applied in about 12,500-lb. increments up to 152,700 lb., at which point cracks occurred. This cracking, at 2.9 times the design live load, was probably caused by poor seating of the loading beam. However, no visible slip occurred at the corners where the slab joined the beam. When the load was released, cracks closed up completely.

The load producing maximum moment was also applied in 12,500-lb increments. Even though the first crack occurred at 102,000 lb, these increments were maintained to 127,000 lb. This corresponds to 3.2 times design live load plus impact.

Upon realese of the load, the crack closed immediately; however, there was a permanent set of about 0.05 in. at midspan. When the beam was reloaded at the same rate, the load-deflection relationship was almost the same as in the first loading. The strain distribution, as well as magnitudes, remained almost the same.

At about 140,000-lb load, two additional cracks developed at the center. One was about 3 ft to one side, the other 4 ft to the other side of the first crack. The cracks made approximately a 60-deg angle with the horizontal and progressed upward as the load was increased. At maximum load, the cracks were about 1-in. wide at the bottom of the beam.

Ultimate load was reached at 180,000 lb. This was 12% higher than



Le Roi Model 85 compressor providing air power for painting bridge steel. Le Roi compressors are available in sizes from 85-cfm to 600-cfm, with gasoline or diesel engines.

4 Million Cubic Feet of Air Power per Day Speeds New Bridge Construction

Le Roi Airmaster Compressors provide power for sand-blasting and spraying 46,000 gallons of paint on new 21,243-foot bridge.

Also use Le Roi airpower on construction work at water level.

Working air power, in the yard, on the deck, and at water level, totals about 4 million cfm a day.

Nearly 200 feet above San Francisco Bay, a fleet of Le Roi compressors provides 95% of the air power for spraying 46,000 gallons of paint on new bridge steel. The project is a $62 million bridge to span 4.4 miles of windswept water. It will link the cities of Richmond and San Rafael, California.

Compressors exposed to elements. High up on the bridge structure, Le Roi compressors are exposed to cold, moist, salt-laden winds. Only equipment designed for the toughest construction work can give top performance under these conditions — another reason why contractor D. E. Burgess uses Le Roi compressors to spray 46,000 gallons of paint on four miles of bridge steel.

Sandblasting is rugged work. Back in the yards, Le Roi compressors are also providing air power for sand blasting. It's tough, continuous work . . . fills the air with abrasive dust. Yet Le Roi compressors keep a steady flow of air power at work. They're easy to start, too. That's why more than a dozen compressors are used on this enormous and important project.

Prime contractors on this bridge project are Judson Pacific, Murphy, Kiewit. Upon completion, it will be the world's second largest bridge surpassed only by the famed San Francisco Bay bridge.

Le Roi's are designed for dependability. Le Roi compressors were chosen for this big project because they combine long service, good fuel economy, low cost maintenance, and deliver more cool, clean air for less money. Valves are interchangeable and accessible for quick, easy maintenance. You also get more generous cfm with lower rpm. Lower rpm means lower speed — the result, less heat, less wear, and less fuel.

Le Roi Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin also manufactures Tractair and stationary air compressors, air tools, and heavy-duty engines. Write today for information about any of these products, or see your Le Roi distributor.

This Le Roi 600-cfm compressor is providing air power for tough job of sand blasting new steel. It's one of a fleet of Le Roi compressors at work on 4½ mile bridge project.

the calculated value using the expression given in "Criteria for Prestressed Concrete Bridges," Bureau of Public Roads, U.S. Department of Commerce. The maximum deflection at midspan when the test was stopped was 10¾ in.

- **For future design**—In this test, the maximum horizontal shear was computed at 265 psi without any detectable effect whatever on the joint. This showed that the bond between concrete surfaces was of the order of that between concrete and bars. A horizontal shearing stress of 0.06 $f'c$, with a maximum of 210 psi, might be a reasonable assumption. This would be in line with the AASHO specification for bond of bars near the top of beams and girders. It would be for the case of no keys but with tie-down steel.

Ralph W. Kluge and Donald A. Sawyer of the Civil Engineering Department, University of Florida, assisted in conducting the test.

Kentucky Best-Mapped State After Federal-State Program

Kentucky is celebrating completion of a $6.4 million cooperative mapping program with the U. S. Geological Survey that has placed the Blue Grass State ahead of all others as the best-mapped state in the Union, according to Acting Secretary of the Interior Clarence A. Davis.

The new mapping, accomplished at a scale of 1:24,000 completely covers the state. Twelve other states also have complete map coverage, but of these, only Massachusetts, Rhode Island and Connecticut have a large percentage of their area covered by modern mapping.

In contrast to Kentucky's 100% coverage with top-grade mapping, the country as a whole has less than 40% coverage at the standard scales of 1:62,500 and 1:24,000.

Kentucky's program was accomplished on a dollar-for-dollar matching basis between state and federal government. It began in 1904 with an appropriation of $5,500.

At the present time there are thirty 50-50 cooperative agreements in effect between USGS and various states. Since completion of the Kentucky program, the two largest cooperators are now California and Indiana, who appropriated $300,000 and $200,000 respectively for what will be their annual share of this year's mapping operations.

During the current fiscal year, cost of mapping activities by the Geological Survey will total approximately $16,010,000 and will cover about 4% of the unmapped areas in the U. S.

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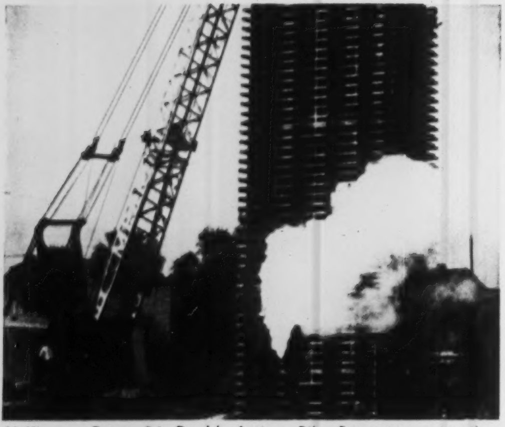
For the Savannah River Bridge

McKiernan-Terry S8 Single-Acting Pile Hammer driving piles for cofferdam of main pier



McKiernan-Terry E4 Double-Acting Pile Extractor extracting pile at approach pier

all piles for 56 piers driven by

McKIERNAN-TERRY HAMMERS

When Merritt-Chapman & Scott undertook to build the outstanding Savannah River Bridge and Causeway designed by Parsons, Brinckerhoff, Hall & Macdonald, they were faced by a tight schedule of construction on difficult soil conditions and terrain.

To make sure of speedy, trouble-free and economical pile driving, the contractor relied exclusively on McKiernan-Terry Pile Hammers, using an S8 Single-Acting Hammer, and two 9B3, three 10B3, and two 11B3 Double-Acting Hammers. A typical performance of these powerful machines was the consistent 9-hr day record of driving 35 piles 40 feet underwater by each of the McKiernan-Terry 11B3 Hammers. In addition, a McKiernan-Terry E4 Double-Acting Pile Extractor was used for withdrawing piles.

Contractors all over the world have learned they can safely rely on McKiernan-Terry equipment for their pile-driving jobs. Write for bulletins describing McKiernan-Terry Hammers and accessories for *your* next project.

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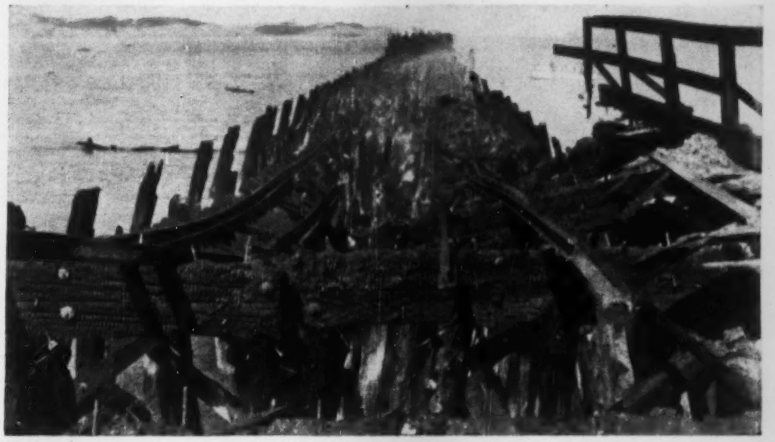
MK 379

Salt Lake Trestle: Out, Back in 7 Days

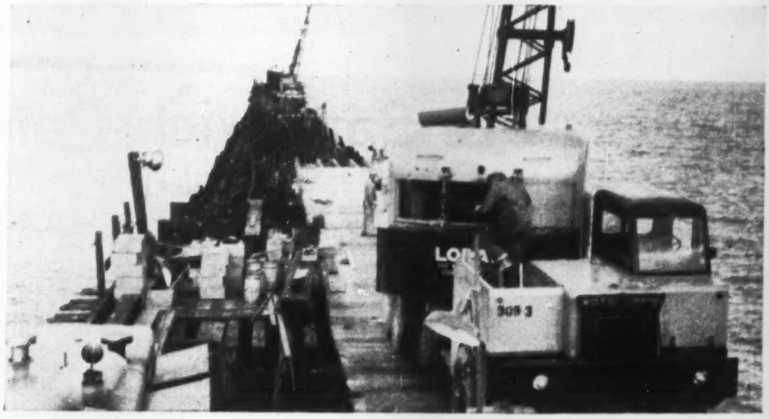
Although it is to be replaced in a year or two by an earthfill causeway (ENR Mar. 22, p. 24), the Union Pacific Railroad's 32-mi Lucin Cut-Off across the Great Salt Lake is still a vital link in the nation's transcontinental rail network.

So when a 645-ft section burned out in a fire on Friday May 4, the railroad rounded up construction crews from all parts of its line, including men preparing the site for the embankment to come, and succeeded in putting the wood trestle back in service on May 10.

The fire started when flaming material dropped to the timber deck from the journal of a freight train waiting on a passing track. Trains were routed over other lines that go around the 2,500 sq mi lake while repairs were under way.

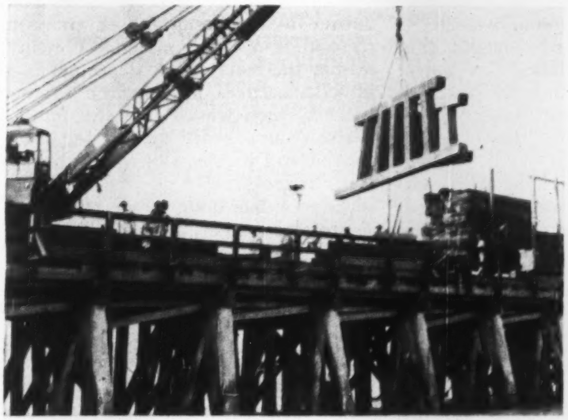


1. Devastation of an all-night fire (halted finally by dynamite charges) greeted engineers on Saturday morning. Burned out section carried passing track, since most of the trestle was built as a single-track line.

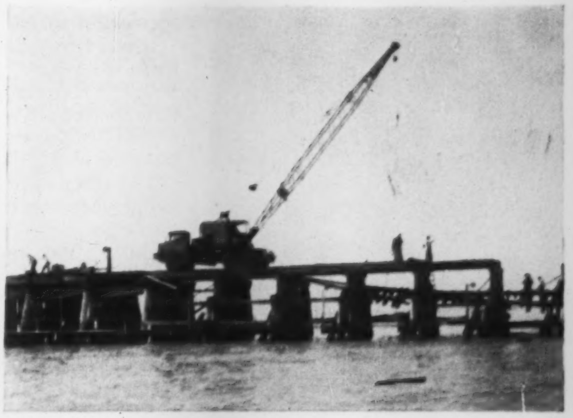


2. With material hauled by special trains from both sides of the lake, round-the-clock repair job got under way. Island, dimly seen at top left, is 10 miles away across shallow, salty water of the lake.

3. Piles that originally rose 15 ft above water were cut off at the point where tests showed them to be sound.



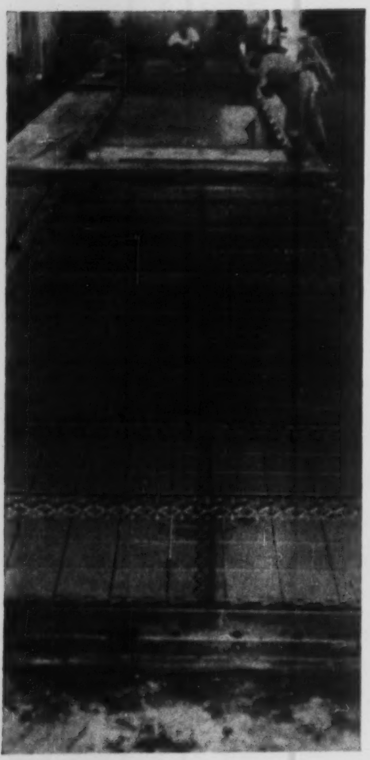
4. With drift pins in place in the old piling to secure the overlay, prefabricated frame bents, built of 12 x 12 timbers, brought the 43 damaged bents back up to level.



5. Moving out over new bents, crane lays stringers for deck, ready for new track. Passing track (hanging in rear) won't be rebuilt. Total repair bill: \$300,000.

For National Security Agency's sprawling new home . . .

Precast Concrete Sandwich Panels



REINFORCING for panels is pre-assembled, placed in mold after facing is cast.

Henning de Bang
Chief Engineer, Research and Development
Marietta Concrete Corp.,
Marietta, Ohio

Over 1,100 precast-concrete sandwich panels—dressed up with exposed colored aggregate—will enclose the mammoth 1,400,000 sq ft, 3-story National Security Agency Building now under construction at Fort Meade, Md. This is a new application of the panels which normally are used on industrial buildings with conventional aggregates and only a broom finish.

Framed in reinforced concrete, the large four-story building measures 560x980 ft overall. An area, 700x220 ft, removed from one side of the overall rectangle, gives the building the plan of a giant U.

The colored, precast-concrete panels are mounted on support angles bolted to the reinforced concrete frame of the building. An average panel is 120 sq ft in area. In section, it consists of two 1¾-in. layers of concrete separated by 1½ in. of glass-fiber insulation. Heat-transmission coefficient U is 0.14. The panels are good acoustic insulators as well.

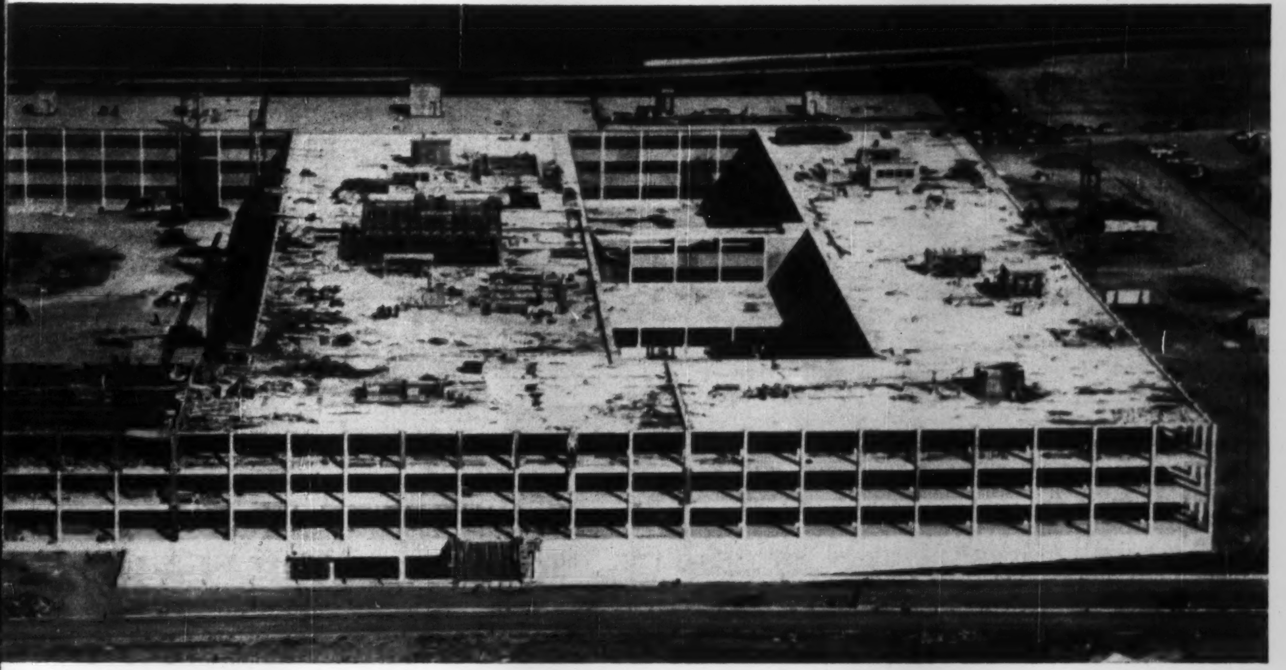
Structurally, the sections are designed to carry their own weight plus the weight of the windows they support. In addition, they are reinforced laterally to withstand up to 100 mph winds. To make each panel work as a unit, the two concrete shells retaining the insulation material are connected by a series of expanded-metal channel-shaped shear ties.

• Color through stone—For the panel's exterior facing, aggregates of No. 1 and 2 size Cardiff green stone and royal green stone are used. The first is quarried in Maryland, the latter in New Jersey.

Since the panels were cast face down, it was important to prevent segregation of facing material. For this reason, the concrete was deposited first in wheelbarrows placed close to the batcher, then wheeled to the forms, where it was gently placed by hand shovels and padded down with a mason's trowel.

After a half-hour, a pre-assembled reinforcing basket was placed in the mold. Following this, the men deposited the first layer of structural backup concrete. Since this mix had considerably less slump than the facing mix, it could be deposited in the forms by a crane bucket.

Glass-fiber insulation sheets, precut to fit between the expanded-metal shear ties, went in place following levelling off the concrete. Finally, the men wired the top layer of mesh rein-



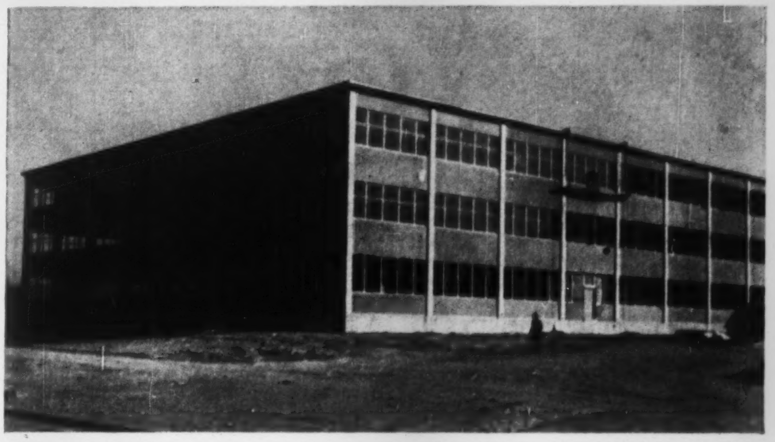
Turn to Color

forcing to the reinforcing basket and the second layer of structural back-up concrete was spread, screeded and wood floated.

Pneumatic vibrators fastened to the underside of the steel forms consolidated the different layers of concrete. Care had to be taken not to over-vibrate the concrete, to prevent segregation as well as to preclude affecting the water-cement ratio by producing water gains in the forms.

The next day or after about 24 hours, the panel was picked up from the casting floor by an overhead crane and carried to the processing area, where it was set down nearly vertically against a pair of A-frames. Equipped with electric machines and wire brushes, the processing crew immediately went into action. The panel was first sanded to remove the surface film of cement formed in the casting mold, after which it was brushed to expose the aggregate.

Acid wash was used to clean the aggregates and bring out the color and lustre of the stones. Care had to be taken that none of the matrix should be eaten away by this process, since the panel color might be affected. Compared to the stones the matrix is light in color, so if the stone relief is deepened, the color of the panel will deepen also.



COLORED PRECAST PANELS enclose completed wing of new National Security Agency Building, Fort Meade, Md. Mounted in the reinforced concrete frame of the building, panels are held in place by support angles bolted to the face of columns.

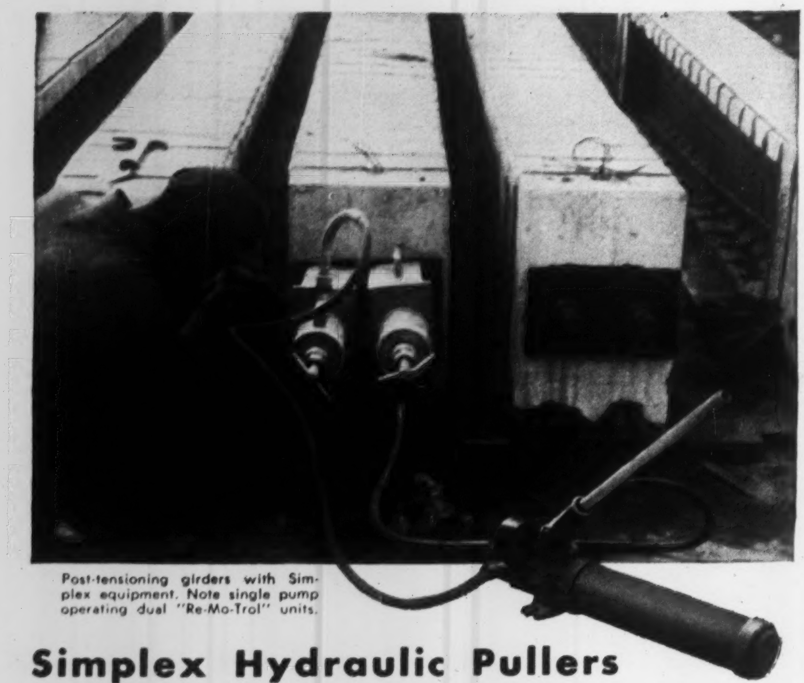
- **Cured after acid bath**—A few minutes after the washer completed acid swabbing the slab, a hose man washed away all traces of acid. Besides cleaning the panel, the hosing constituted part of the wet-curing process.

Panels were covered with saturated burlap and paper immediately. Thermostats set at 70 F controlled the temperature. After 15 to 20 hours of curing, the panels were moved to another location in the shop. Here they remained for four days. During this time, they were kept continuously wet on both sides.

After shop curing, the panels were taken to a yard where they were stored for three more weeks. In the summer, to keep the concrete in the yard from drying out too rapidly, the panels were draped in sheets of muslin. In the winter, to protect them against the possibility of thermal shocks, they were covered with heavy tarpaulins.

Specifications called for a minimum strength of 1,200 psi before side forms could be removed and the panels handled. It was further specified that any translation or rotation of the panels without the support of the steel forms had to take place in vertical or near vertical planes. As an alternative, vacuum lift would be considered.

After study, it was decided that tilting the forms would offer the most expedient method of initial lifting. The forms were pivoted with a spreader beam suspended from a



Post-tensioning girders with Simplex equipment. Note single pump operating dual "Re-Mo-Trol" units.

Simplex Hydraulic Pullers Provide Greater Efficiency in Concrete Prestressing Operations

Construction Men Acclaim Ease and Safety of Simplex Methods

Pre-tensioning and post-tensioning concrete becomes a quick, easy task with Simplex hydraulic equipment. Because of the "center-hole" pulling feature of Simplex units, wires, rods and cables can be tensioned without torque, "off center" pressures or complicated back-up devices. Eliminating these factors accounts for a 75% increase in ease and efficiency.

Simplex "Re-Mo-Trol" units consist of a "center-hole" hydraulic pulling ram connected by high pressure hose to a hand, air, electric or gasoline operated hydraulic pump. This powerful combination permits uniform stressing with maximum operator safety and speed. Once the ram is in place, the pump can be actuated safely from any nearby, convenient location.

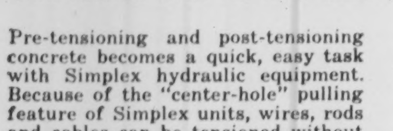
"Re-Mo-Trol" hydraulic pullers are ideally suited to prestressing operations at the job site and for use in permanent pre-tensioning beds. These versatile Simplex units are available in standard capacities from 10 to 100 tons, and can be used for heavy tonnage high-pressure tensioning of cables, rods or wires or for pushing or pulling against a holding bracket in multiple bed stressing operations.

The standard Simplex units provide a range of capacities sufficient for most applications. However, custom-built units are available up to 600 ton capacity.

Another Simplex hydraulic puller, the "Jenny", is a self-contained unit which serves as its own back-up or can be used with a simple chair to reduce set-up time.

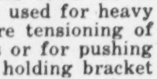
Either device can be used not only as a puller but as a hydraulic jack or press for moving heavy equipment and the like.

For detailed data on the selection and application of Simplex Pullers for prestressing concrete and other construction jobs, write for your copy of our new bulletin: "Hydraulic 56".



SIMPLEX "RE-MO-TROL"—Remote-Controlled Unit has ram connected to hydraulic pump by high pressure hose for safe, convenient use in tight spots and dangerous locations. A pressure gauge may be installed for checking tensioning pressure.

SIMPLEX "JENNY" is a hydraulically operated center-hole puller which also serves as a press or heavy duty jack. It is a self-contained unit available in capacities from 30 to 100 tons.



TEMPLETON, KENLY & CO.
2553 Gardner Road • Broadview, Illinois

crane hook. They were secured in a vertical position by locking a pair of hinged scissor braces. To lift the panel, the spreader beam was shifted to engage four lifting rods that run the height of the panel.

For the trip to the job site, the panels were placed on trailers and trucked.

At the site, a mobile crane picked up the panels and set them in place, where they were attached to angles on the face of the columns. The angles were bolted to wedge inserts set by the concrete contractor when he concreted the columns. Erection time for a panel was ten minutes.

• **More to building than panels**—Interior wall finish will be porcelain-enameled steel panels with under-window heating and cooling fixtures built in. Each floor consists of a 9 to 10-in. thick reinforced concrete slab supported by concrete columns spaced 20 ft c-c. A glass-fiber acoustical ceiling is hung about 2 ft below the slab to allow space for air ducts and exposed telephone lines. Ceiling height is 9½ ft. Each slab is a maze of in-floor ducts for eight separate systems of electrical conduit.

Structural design of the flat-slab floors relies on capitals at the columns but no drop panels. Additional reinforcement (about 10x10 ft) in the slab over the column takes the place of the drop panel and simplifies forming. Slab formwork was supported by movable tubular shores, which made possible substantial savings.

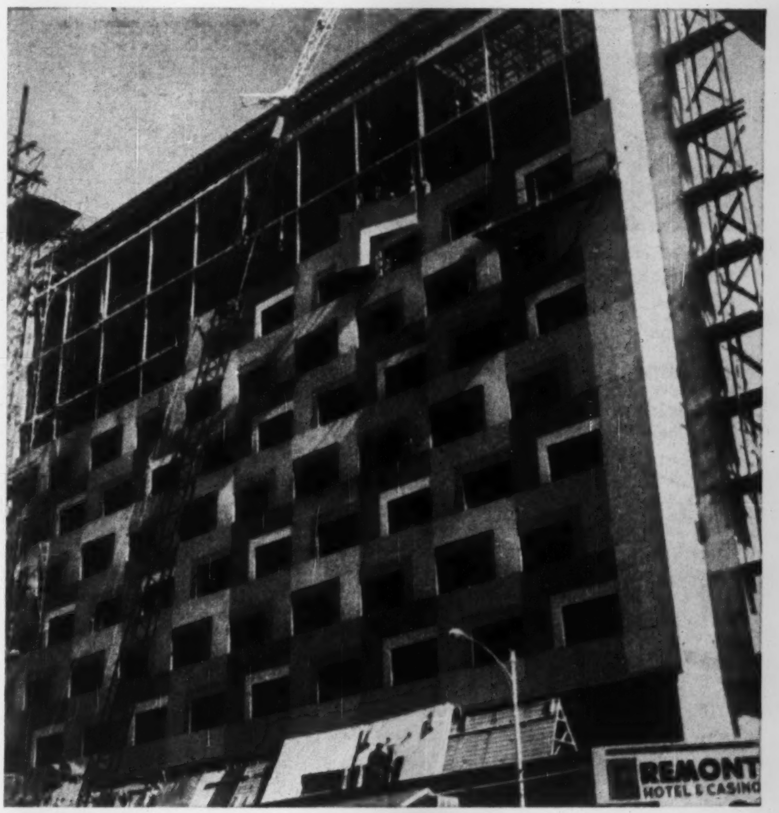
For the NSA Building, the precast exposed aggregate concrete wall panels are a joint development of the Marietta Concrete Corp., Marietta, Ohio, and Earley Studio, Inc., Rosslyn, Va. The building is being built for the government under the supervision of the Corps of Engineers, U.S. Army, Baltimore District. Lt. Col. E. J. Ribbs is resident engineer.

The Marietta Concrete Corp. was one of the pioneers in the development of precast concrete sandwich panels for curtain-wall construction (ENR Jan. 24, 1952, p. 34). Within the past few years, the firm has produced 4,000,000 sq ft of panels.

Architects for the panelled structure are Reisner & Urbahn of New York City. Anderson-Nichols & Co., Boston, Mass., are the engineers. Construction is a joint venture of general contractors Chas. H. Tompkins Co., Washington, D. C. and J. A. Jones Construction Co., Charlotte, N. C., under a $20-million contract, which also includes a supply building, a complete electric power substation, roads and parking areas. Completion is expected by the end of this year.

. . . Precast Concrete Also Encloses Las Vegas Hotel

Here, Curtain Walls Are Tri-Colored



Precast concrete panels of striking appearance form curtain walls on the two long sides of a new 13-story hotel in Las Vegas, Nev. Three colors are displayed in various combinations by the two-tone L-shaped panels that deck out the building. Color of about half the wall area is coral, the remainder being maroon or beige, with some purple trim.

Panels are L-shaped to provide a window opening in which aluminum sash is mounted. A panel extends from the bottom of one window to the botton of the window on the floor above. Inside surface, smooth trowelled during casting, is stipple-finish painted after installation.

The panels were installed for the Fremont Hotel in downtown Las Vegas—said to be the tallest building in Nevada. The narrow structure (50x130 ft in plan) has 160 hotel rooms plus the usual public rooms found in Nevada hotels.

• Panel load taken by floors—The 3⅝-in.-thick panels each weigh 3,000 lb and measure 12 ft wide by 9 ft high (less window openings). They are bolted to the floor slab and to mullions so that neither the panels nor the mullions carry vertical load. End walls plus 14x30-in. columns set 10 ft back from the exterior walls are the primary load-carrying elements.

Steel 6-in. and 5-in. T-beam mullions were bolted between floors, where they could later be enclosed in cross partitions. The panels were fastened to these T-beams. And each panel was bolted to the floor slab in four places.

The building is of flat-slab, reinforced concrete construction. It contains only two rows of columns spaced on 24-ft 3-in. centers longitudinally and 30-ft centers transversely. Slab thickness is 9½ in. of lightweight concrete.

WORKMEN position panel, fastening it to floor slab and T-beam mullions.

Lateral force resistance is provided by a solid cast-in-place wall at the north end, together with solid walls around the elevator shaft and the south-end stair well. The precast panels form the entire east and west walls plus a part of the south wall.

• Concrete panels bid low—The design permitted either precast concrete walls or steel panel walls. Cost of the precast panels proved to be about half the cost of the steel panels.

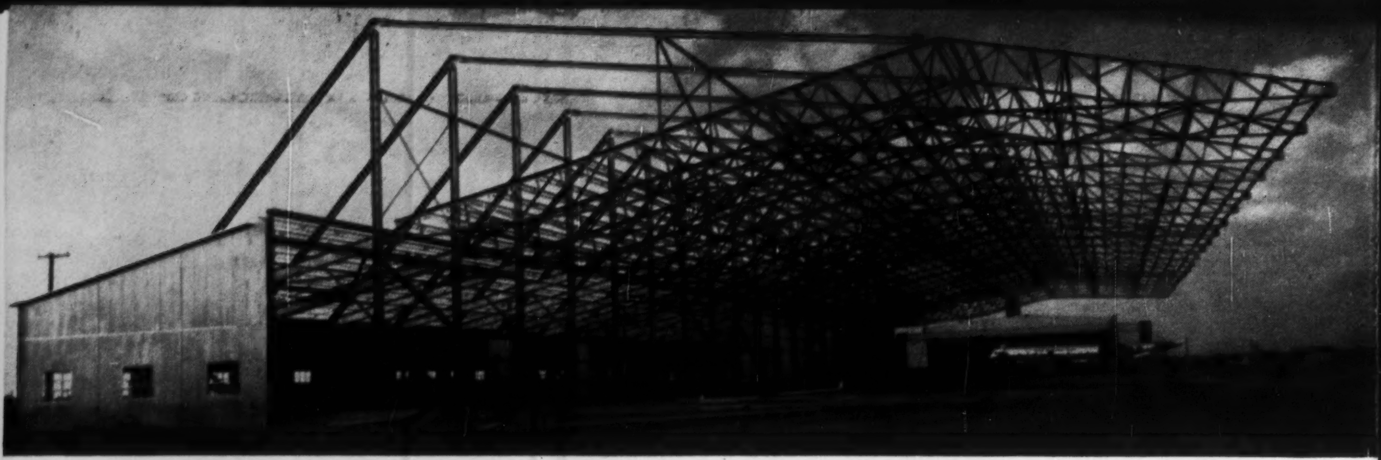
The panels are faced with Mosai—an architectural cast-stone finish in which stone chips are bound into pigmented cement mortar. Normal thickness is usually just enough to form a rigid unit that is hung on masonry walls. However, for the Fremont Hotel, the panels were made 3⅝ in. thick. Only ¾ in. of this thickness is facing. The remainder is lightweight concrete weighing about 100 pcf.

Both the Mosai finish and the lightweight concrete were required to be 4,000 psi (test ran over 6,000 psi). Reinforcing for the panels is galvanized, welded mesh of No. 3 bars on 4-in. centers in both directions.

The panels were not polished, as is the case with some Mosai work. Rather the stone chips were brought into slight relief by acid etching of the cement after the panels were cast.

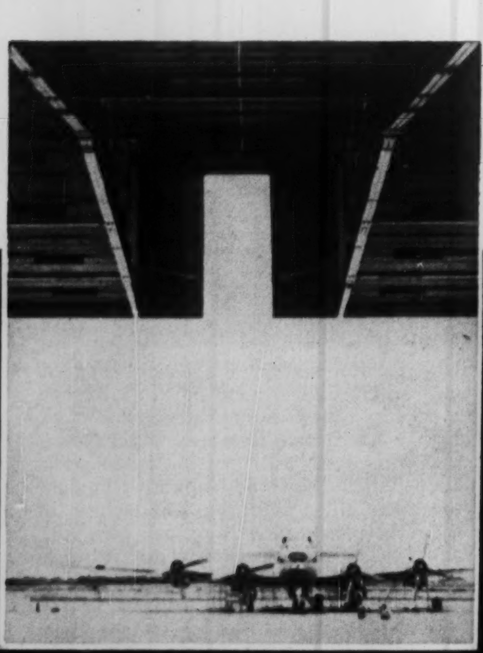
The precast concrete exterior units were made by Otto Buehner Co. in Salt Lake City and trucked to Las Vegas. A load of 15 panels weighing 3000 lb each required an overload permit to travel the 450 miles on Utah and Nevada highways. The units were unloaded by crane and stacked temporarily on an elevated platform. When time came to install the panels, they were lifted to floor height by the crane. There the load was transferred to a monorail that supported the panels while they were being bolted in place.

Wayne McAllister and William C. Wagner of Los Angeles were architects on the building. Structural design was by John A. Martin, Los Angeles structural engineer. Contractor is Robert E. McKee, General Contractor, Inc., of Los Angeles and El Paso.

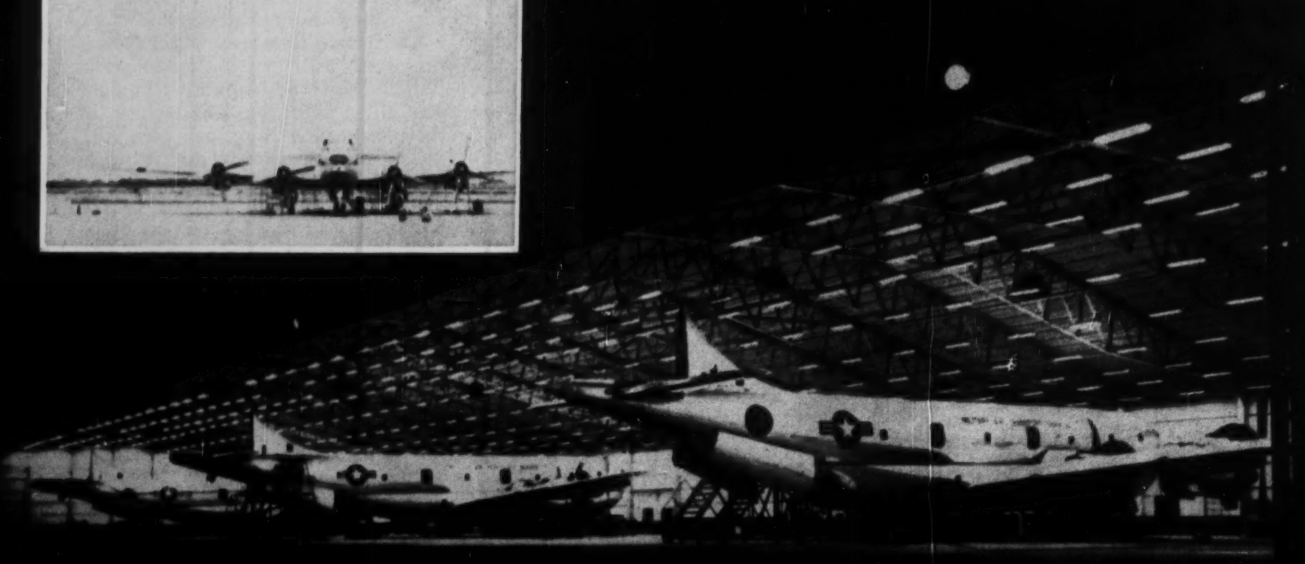


The 76-foot-long member which connects the top ridge of the cantilever to the top of the inner column is designed to act either in tension or compression—supports weight of roof loading, and withstands 30 psf uplift from wind under roof.

Ingenious hangar



Vertical clearance rises to 45 feet inside the three tail housings which open at the edge of the overhanging roof to admit the tails of these Boeing Stratocruisers.



The unique hangar was designed and constructed by the Erwin-Newman Co., of Houston, Texas, under their patent No. 2,687,102.

The hangar is designed for 25 psf roof load and 15 psf horizontal wind force. Rear columns are bolted to deep concrete piers since they must withstand a pull of 14 tons per column from the weight of the cantilevered roof structure, which amounts to only 11.8 psf.

has no columns...

cantilever construction spans 120 ft.

at cost of only $2.40 per sq. ft.

• The hangar area of this efficiently-designed building of Temco Aircraft Corporation at Greenville, Texas, is completely unobstructed by supporting columns. The clear area measures 120 ft. deep x 432 ft. long x 30 ft. high.

The roof is carried on 120 ft. steel truss cantilevers, connected by means of rocker joints to 56 ft. tall inner columns, which in turn are joined to 19 ft. outer columns placed 40 feet farther back. The space between the two rows of columns is conveniently used for workshops, parts storage, and offices.

The prefabricated Structural Steel framework for this hangar was bolted together in *only six working days.* The framing cost $2.40 per sq. ft. Framing and roofing cost $3.26, and the complete building including services, foundations, and 32,400 sq. ft. of concrete apron totaled $5.06 per sq. ft. Approximately 1,000 tons of Structural Steel were used in the building framework. Speedy construction was an important factor in holding down costs.

Where economy of construction is coupled with dramatic design, that's where you'll find versatile Structural Steel. Moneywise, Structural Steel is the most economical of load carrying materials. Also, it's the strongest and most versatile. It will withstand more abuse than other structural materials, effectively resisting tension, torsion, compression and shear. Once enclosed in buildings, it lasts indefinitely. No maintenance required.

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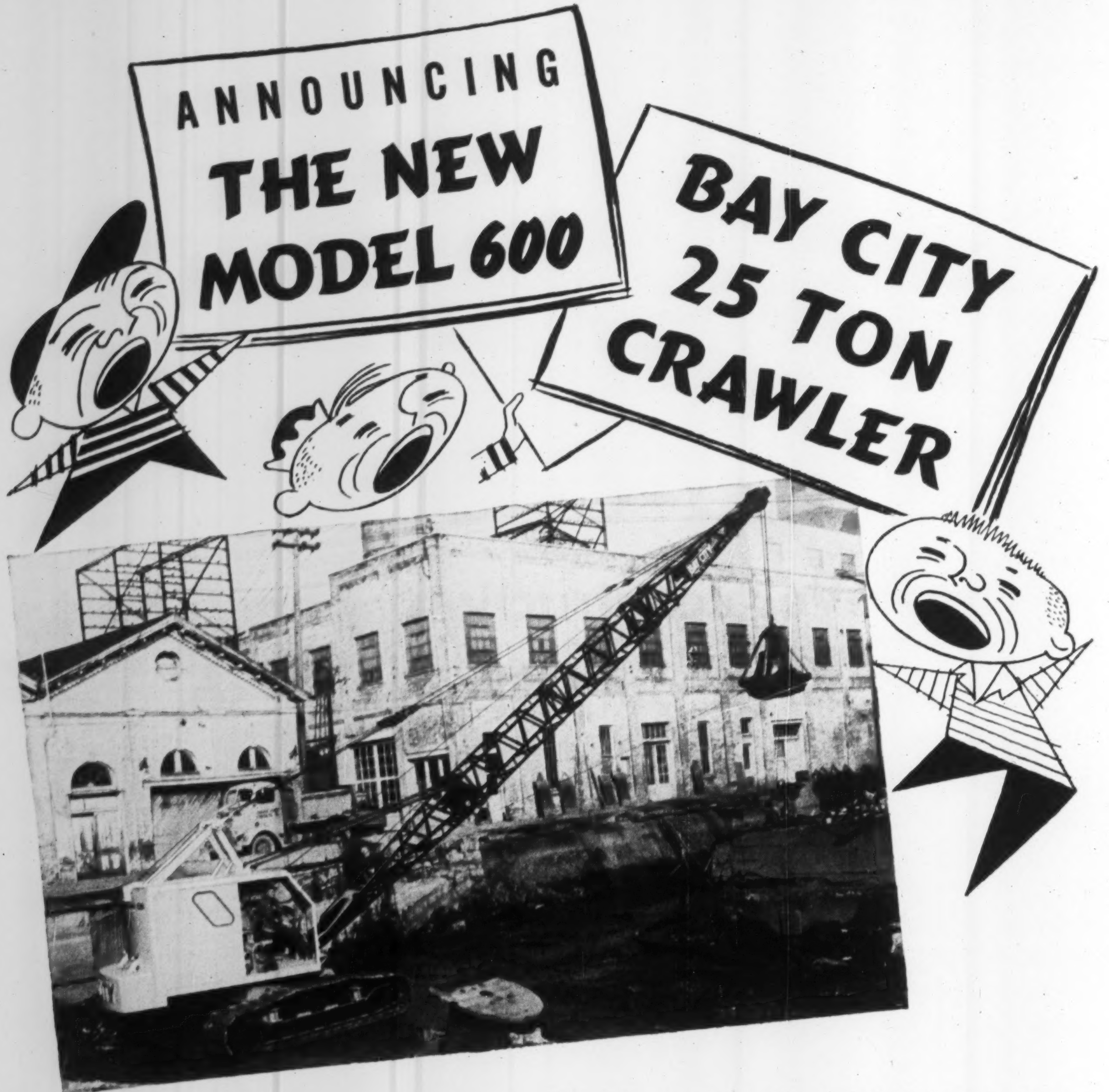

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Shown here working with a clamshell on a 55 foot boom, the new BAY CITY 25 Ton Crawler is a versatile erectors' crane that does many jobs with ease . . . it is a beautifully balanced crane with plenty of power for you. The new BAY CITY has load ratings ranging from 50,000 lbs. at ten foot radius with a 30 foot boom to 1,650 lbs. at 70 foot radius with a 100 foot boom. Its independent worm boom hoist raises and lowers boom and load only under power through separate friction clutches. A special load-lowering mechanism is available for precision lowering of heavy loads. Telescopic boom backstops and hi-collapsible gantry are standard. For handling maximum loads the three sheave boom point and load block can be used with 2, 4, or 6 part lines. As a crane with 30" shoes and standard equipment, it weighs 58,000 pounds. For further details on the new 25 Ton BAY CITY Crawler, write for Bulletin 600 A.

262

Four-way attack . . .

IH Bids for Bigger Share

The International Harvester Co., unleashed a broadside at the construction equipment market recently, at its Dundee, Illinois, proving grounds. Three big guns, introduced by the company and its wholly owned subsidiaries, the Frank G. Hough Co. and International-Drott, are the 1¾-cu-yd crawler-tractor Model 12 front-end loader and two off-highway, rear-dump truck units, that introduce the company's "Payhauler" line.

The new Model 12, a rear-engine, high-speed (10 mph forward, 13 mph reverse), crawler-type front-end loader, has been five years in development.

The off-highway haulers, at present powered by 250 and 335-hp Cummins turbocharged diesel engines, feature speeds in excess of 35 mph. Designed from the rubber up, job-tested by contractors under a wide range of working conditions for a year before final design phases hit the drawing boards, the haulers' struck capacities are 12 and 16 cu yd respectively.

The larger of the two, Model 95, is equipped with a single stage torque converter and powershift transmission, hydraulic steering, a 24-volt electrical system and power brakes.

The smaller, Model 65, has a manual (air assisted) clutch with new facings—now standard equipment on all International crawler tractors—composed of ceramic material and fused powdered metal. It also has hydraulic steering, power brakes and the two-battery, 24-volt electrical system.

Main framing members are claimed to have the highest section modulus of any off-highway hauler. On the "95", weld-fabricated I-beams have a section modulus of 130 in.^{3}, and on the "65", the main side members have a section modulus of 108 in.^{3}.

• New equipment just a starter—The company, with its revamped Construction Equipment Division—formerly the Industrial Products Division—has carried its program over a wide front. Every tractor in its line has been repowered to provide 10 to 30% more drawbar hp, with accompanying modifications in transmission and final drive assemblies to take care of the added power. Longer track life and less downtime have been achieved, according to the company, through an exclusive 3-point track suspension. All tractors are equipped with new cerametallic engine clutch facings, and torque converters are available in some models.

Operator comfort has been "designed in" through use of foam rubber, centrally grouped instrument panel and new re-designed steering control levers that reduce lever pull 25% below previous models. The operating deck is flat, and seats have been raised to provide greater visibility, and even a cigarette lighter has been provided.

International has added 42 new front-end attachments to bring its total attachment line to 228 production units. Most spectacular of the front-end attachments is the Drott 4-in-1 that is now available for all but the largest tractor models, and is slated soon to become available for those also.

Even rubber-tired, self-propelled scrapers have come in for their share of major changes. The "Payscraper" line has a newly designed apron with arms outside the bowl. The bowl itself has been modified for dozer-type digging action; a lowered silhouette increases visibility and greater payload capacities have been linked with the 172-hp and 262-hp engines to give high hp-to-capacity ratios for both its 14 and 20-cu-yd self-propelled scraper models.

The Hough company is now producing six rubber-tired, rear-engine, front-end loaders in addition to the newly introduced Model 12. Ranging from 18-cu-ft to 2-cu-yd models, the "Payloaders" are equipped with torque converter drives with the exception of the largest model. That has a power-shift transmission that eliminates foot clutching, with shifts possible in all speeds without stopping.

• On the highway, too—Three new V-8 engines are introduced in nine series of over-the-road conventional and cab-over-engine truck models. Four and six-wheel units, with gross vehicle weight ratings of 24,000 lb and gross combination weights of 50,000 lb and up, are powered with the new plants, which supplement the company's existing line of gasoline, liquified petroleum and diesel power plants. INTERNATIONAL HARVESTER COMPANY, 180 N. MICHIGAN AVE., CHICAGO 1, ILL.

Portable Drill Sharpener

A handy tool sharpener for electrician, carpenter, plumber or other mechanic who doesn't have ready access to stationary grinding equipment is the new Drillmate. Designed for use with any electric hand drill, it can sharpen drills up to ½ in. dia., as well as chisels and other tools.

The device is a 3 in x ½ in vitrified grinding wheel, mounted on a ¾ in. shaft (reduced to ¼ in. to fit any portable drill chuck); with an adjustable tool rest, and a drill gage to check point symmetry. It can be used on any flat surface, without special mounting. Popular Manufacturing Co., 4115 Glencrest Rd., Minneapolis 16.

Higher Strength in New Grade Flattened Strand Wire Rope

An extra high strength grade of flattened strand wire rope—said to be 15% stronger than previous products—is now available.

To be called Porter Imperial Red-Strand Wire Rope, the stronger grade offers these advantages: greater-than-normal temporary loads can be handled without changing rope; greater resistance to unexpected momentary shock loads; greater resistance to fatigue, abrasion, crushing. LESCHEN WIRE ROPE DIVISION, H. K. PORTER CO., INC., ST. LOUIS, MO.

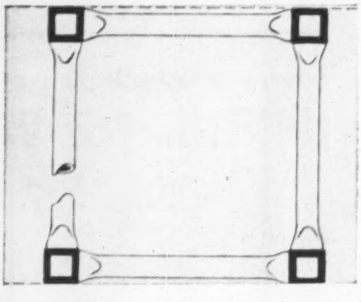
Tongs to Lift Brick Loads; Leg Swings-in Pallet Loads

Two new machines are now available for handling brick and palletized loads.

The Brick-Lift—operating on much the same principle as a pair of tongs—is said to be capable of picking up, without pallet, 312 bricks, and placing the brick on scaffolding. A conventional crane does the hoisting. The attachment is centered over a pile of material, dropped into place, and a releasing pin removed to free the tongs for a firm grip on the bottom layer. Caging prevents any slippage of brick in higher layers.

The Floor Loader can handle up to 5 tons of load, using a pallet. The machine consists of two heavy legs, lifted by a crane at the center. One leg carries a hitch for picking up the load, the other leg is used to hook over the floor above where the material is to be placed. Lowering the crane rope makes this second leg act as a lever on which to swing the load to the desired spot. A. F. Kuehne, 73 Warren St., Needham 92, Mass.

Square Tubular Crane Booms Boost Capacity, Weigh Less



A new all-welded crane boom featuring main chords of square tubes weighs 20% to 30% less than booms with chords of conventional tubes or angle steel. This weight saving is said to provide an increase in the rated crane lifting capacities.

It is claimed by the manufacturer that use of square tubular main chords results in a 15% increase in column strength per lineal foot over round tubes and 90% over chords of angular cross section of the same materials. Lacing needed for proper column support and torsion resistance is reduced, contributing to weight reduction.

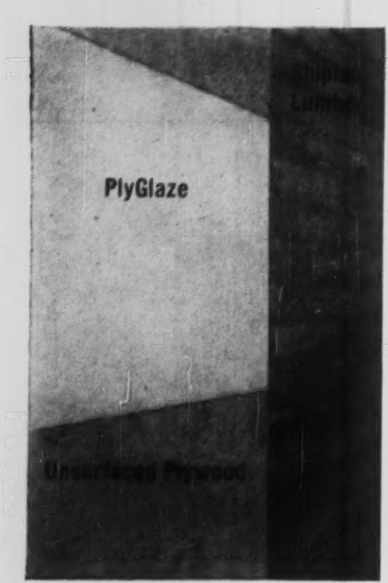
(Continued on page 78)

Vibrating Screed Adapted to Deck Work

A new concrete vibrating screed, said to be especially adaptable to bridge decks, is now available in a size that permits the screed to strike off and shape the surface as it is pulled along by two men.

The vibrating unit, powered by a 2½-hp engine, is mounted in the center of the beam, isolated from the screed's vibration by rubber mounts. A special throttle control is used to control the speed of vibration from one end of the beam. The control has a locking device so that the throttle can be locked in any position in spite of the vibration of the screed that may be going on.

End roller and handle assemblies are also isolated from the screed's vibration by rubber mounts. The rear end roller on each side is balanced and mounted in such a way that it automatically flips up to support the screed beam off the concrete when the operator lifts the handle. Underslung beams are used so that the end rollers can ride on I-beam rails mounted above the screeded surface. Stow Manufacturing Co., 19 Shear St., Binghamton, N. Y.



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The lacing in the boom is continuous, of round tubular construction and pre-formed to proper shape before being welded to the square chords. The flat inner faces of the square chords eliminate the necessity of staggering the points at which the lacing is welded to the chords. Thus the horizontal and vertical lacing meets at the same point and increases the torsional resistance of the boom structure at less weight. The Thew Shovel Co., Lorain, Ohio.

Tubeless Truck Tire Changer For Mounting and Demounting

Said to be the first air-powered tire changer for mounting and demounting tubeless truck tires, a newly designed machine is now available.

The device operates on 125 lb of air pressure and permits mounting or demounting a tire in 65 seconds without assistance.

Complete operation of the changer is handled by a pair of two-position control valves. One valve locks the rim in position, the other actuates the pump system that operates the unit. Thus manual labor of rolling beads on or off the rim is eliminated.

Occupying only 40 sq in. of floor space, the machine need not be bolted down and can be operated wherever compressed air is available. Automotive Equipment Mfg., Co., 11000 S. Alameda St., Lynwood, Calif.

Loading Made a One-Man Job With New Compact Power Unit

A compact power loader that fits any standard truck chassis makes the handling of bulky, heavy or awkward materials a one-man operation. The complete unit requires only 20 in. of mounting space behind the cab and frees the entire truck bed for load carrying.

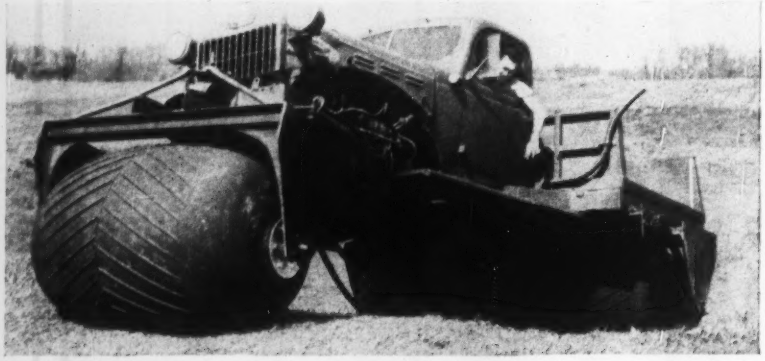
The unit, operated from a power take-off through the engine transmission, is 100% hydraulically operated. The boom swings in a complete circle so that loads can be spotted from either side, front or rear of the truck. Baybrook Hydraulic Division, L. A. Young Spring & Wire Corp., Bowling Green, Ohio.

New Four-Barrel Tar Kettle Comes With Spray Attachment

A new tar kettle is now available for contractors and highway maintenance departments faced with the problem of surfacing highways and other public thoroughfares.

This model has a capacity of four barrels and is equipped with a power spray unit for dispersing tars, asphalts and emulsions. It features high speed, safe operating conditions, even heating and steady output with no waste of surfacing materials.

Capable of operating a six or eight nozzle spray bar, the K-90 engine



Barrel Tires Roll Over Rough Ground

A barrel-shaped, low pressure pneumatic tire, free of weight and mechanical complications, is now generally available.

The Terra-Tire, with its driving force transmitted from the motor through the rear axle by any conventional drive system, can take trucks, trailers and other off-the-road vehicles over all types of terrain and roadways. Speeds up to 65 mph have been achieved.

Because of low pressure inflation (from 3 to 5 pounds) the new "shoes" can find traction and flotation where other tires cannot, the manufacturer claims. The pneumatics tend to "swallow up" rough, uneven surfaces—with little risk of puncture or blowout—by conforming with uneven surfaces instead of resisting them. Goodyear Tire & Rubber Co., Akron 16, Ohio.

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Low-cost general construction hauling of stone, earth or asphalt is provided by the Mack B42S powered by the Mack Magnadyne engine.

"equal to any task"

Says Mr. Charles H. Ready, president of Ready Paving & Construction Co., Chicago, about his Macks . . . and with plenty of experience to back it up.

Back in 1920, the Ready management bought its first Mack to replace horse-drawn wagons. This chain-driven unit was retired only two years ago, after rolling up more than a million miles of heavy-duty construction hauling.

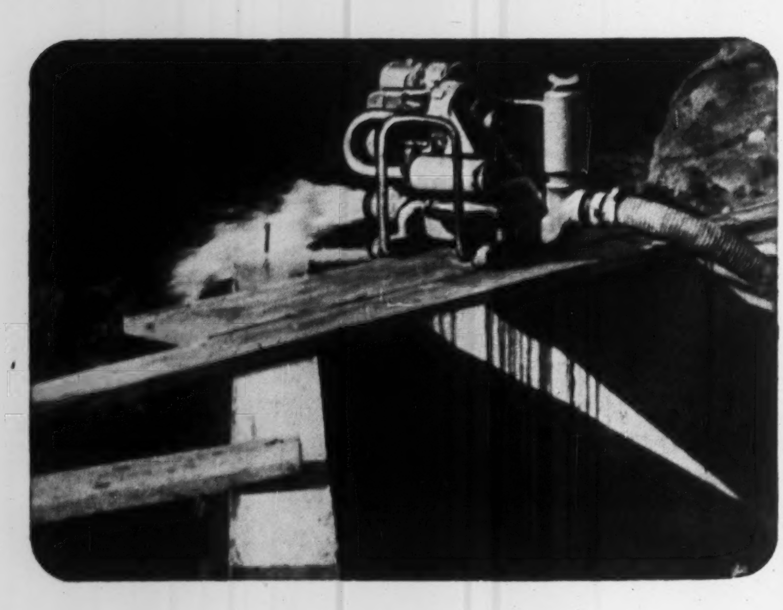
Today, the Ready fleet contains 18 Macks, including seven new B42S dumpers. These six-wheelers regularly haul 15 tons of stone or asphalt, or 15 yards of earth, both on- and off-highway. Their Balanced Bogies with exclusive Mack Power Dividers enable them to work in mud and on rough terrain where other makes can't operate. Famous Mack Magnadyne engines furnish plenty of power to keep these heavy haulers on the move with the barest minimum of time-out for maintenance and overhaul.

Here's how Mr. Ready sums up their 36 years' experience: "Our Macks have been found to be rugged and economical, always dependable, and equal to any task."

That verdict on Macks is practically unanimous throughout the entire construction industry. Whatever you want to haul, wherever you want to haul it, Macks are built to get the job done on schedule, at the lowest cost per mile. Mack Trucks, Empire State Building, New York 1, N. Y. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
TRUCKS

4010

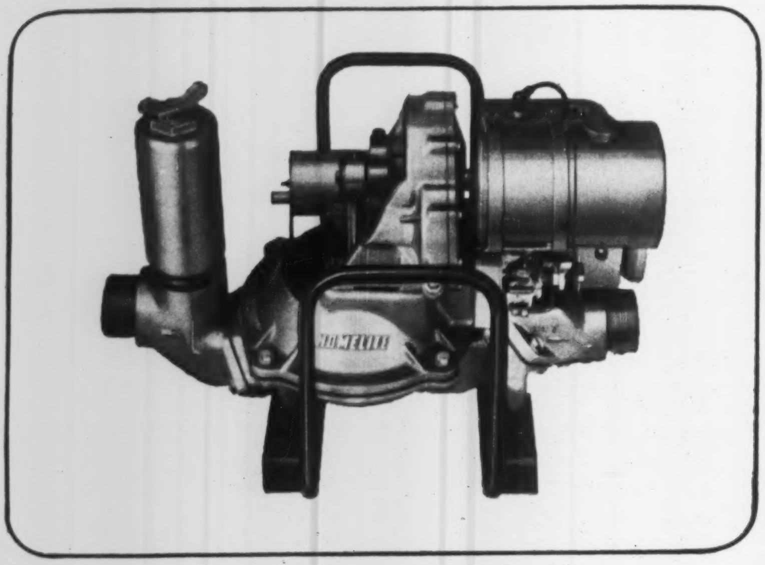


It's here! The new heavy-duty diaphragm pump that's light enough to carry

Here's the diaphragm pump that goes most easily to the job and does more when it gets there. Specifically designed for continuous, heavy-duty work, this Homelite pump will dewater an area at a 5000 g.p.h. clip, then keep right on going to handle seepage in the thickest mud, muck and sand. Yet, because it weighs only 120 pounds, it gets to the job fast . . . even over the roughest terrain.

The entire unit is built for long, trouble-free operation. Manual throttle control adjusts engine speed for full-capacity pumping or handling small seepage flow . . . gives greater fuel economy and prolongs engine life. Ball and roller bearings protect engine and pump from excessive wear. Totally enclosed reduction gears run in oil. Tough, oil-resistant diaphragm can be easily replaced in ten minutes right on the job.

For more information or a demonstration on your job, write or call your nearest Homelite representative.



NEW HOMELITE
Carryable
DIAPHRAGM PUMP

Model 20DP3-1 has guaranteed total lift up to 28′ and total head up to 50′, including friction.

HOMELITE

A DIVISION OF TEXTRON, INCORPORATED
1106 RIVERDALE AVENUE
PORT CHESTER, NEW YORK

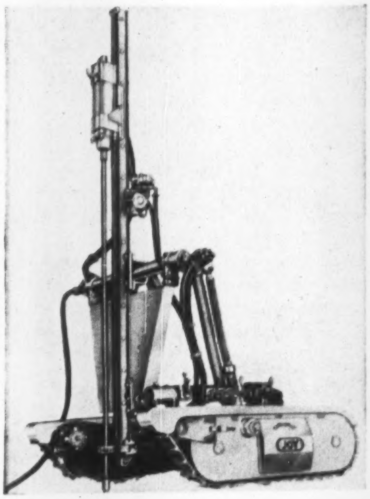
supplies power for the spray attachment and a V-belt drives the ¾" Viking gear asphalt pump. The four-cycle gasoline engine develops 3.6 hp at full throttle. KOHLER CO., KOHLER, WIS.

Cold Galvanizing Compound Can Be Brushed or Sprayed on

Applied with either a brush or spray gun, a cold galvanizing compound for iron and steel surfaces is said to be ideal for repairing damaged hot-dip galvanizing.

Called Drygalv, the nontoxic coating dries to the touch within 30 minutes. Since the dry film contains 95% metallic zinc, it offers the same cathodic protection as conventional galvanizing, according to the maker.

The rust-inhibitive paint will withstand temperatures up to 392F for a limited time. AMERICAN SOLDER & FLUX CO., 19TH AND WILLARD ST., PHILADELPHIA 40, PA.



Complete Power Operation

Designed specifically for construction and quarrying, a new "Junior Challenger" rock drill is said to be the first completely power-operated wagon drill. The machine is a self-propelled, track-mounted drill, that mounts a 360-lb, 4½ in. drifter, and can drill up to 3½-in.-dia holes to depths of 40 ft in any formation.

All movements of feed and drill are performed hydraulically; tramming power is provided by two air motors which are connected directly and require no chains; treads move up and down independently to conform to terrain; the machine can drill at any angle. Joy Manufacturing Co., Pittsburgh 22.

Paint Nonskid Floor Coating On Wood, Concrete or Steel

Brushed on like paint, a new nonslip coating for industrial floorings can be applied to steel treads, metal decks, wood and concrete floors.

Called Sono-Grip, the coating contains fine aggregates, which give it its skidproof properties. According to the manufacturer, it is resistant to gasoline, alcohol, oil, grease and many types of acid. It is said to provide nonslip protection whether the surface is dry, wet or oily.

Available in red, green, yellow or gray, the coating is claimed to adhere well to smooth surfaces such as steel. BUILDING PRODUCTS DIVISION, L. SONNEBORN SONS, INC., 404 FOURTH AVE., NEW YORK 16, N. Y.

Introduce New Fork Lift Truck

The Clark Equipment Co. has announced it will introduce an all-new fork lift truck this week.

Among the features on the new Model X, are self-adjusting brakes, balanced swing-up hood, combination lift-tilt controls on the steering column, optional radiator screens and all-purpose deep-tapered forks. CLARK EQUIPMENT CO., BATTLE CREEK, MICH.

Plastic Drawing Aid

A drawing aid called the "Perspective Guide" is a device intended to simplify perspective drawings. Guides are made from clear plastic, 5/32 in. thick. They come in sets of two 36-in. arms for $8.50 postpaid or two 24-in. arms for $7.50 postpaid. R-D ENGINEERING CO., P.O. BOX 311, BARTLESVILLE, OKLA.

Spill Plate Attachment

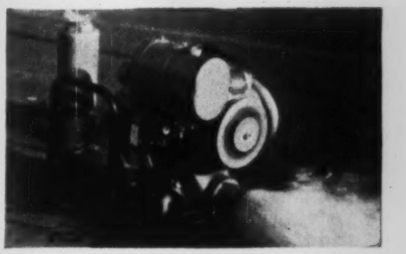
Designed to make full use of the machine's power and bucket action, a new bucket spill plate attachment for Nos. 977, 955 and 933 Traxcavators, is now on the market.

The new attachment is bolted on to the top edge of the bucket. It is adjustable and can be extended from 2½ to 5 inches above the bucket spill plate. CATERPILLAR TRACTOR CO., PEORIA, ILL.

BX Wires Easy to Strip

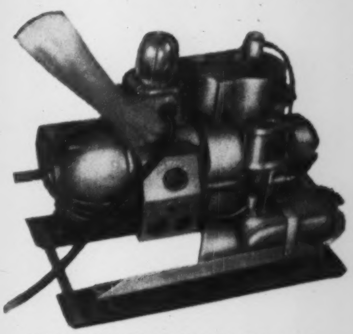
BX armored cable, improved to save time for the electrician, comes with thermoplastic insulation on the individual conductors. This construction eliminates the need for braid,

CHOOSE
from a full line of
HOMELITE
Carryable
Construction
Equipment



SELF-PRIMING CENTRIFUGAL AND DIAPHRAGM PUMPS

Sizes: 1½" to 3" — capacities to 15,000 g.p.h. for dewatering and water supply.



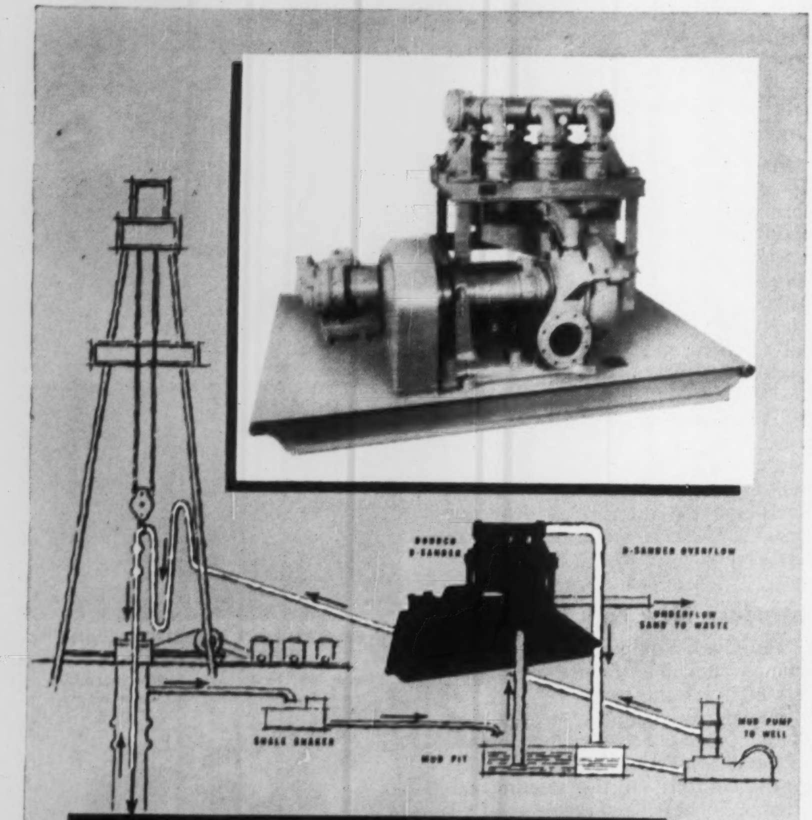
ELECTRIC GENERATOR SETS FOR TOOLS AND LIGHTS

Complete range of sizes and voltages up to 5,000 watts.

LIGHTWEIGHT POWERFUL ONE-MAN CHAIN SAWS

Complete line of saws with clearing and brushcutter attachments for every woodcutting job.

HOMELITE
A DIVISION OF TEXTRON AMERICAN, INC.
PORT CHESTER, N. Y.



Taking The Bite Out Of Drill Mud

Rotary drill muds are employed in oil drilling operations to remove cuttings and sand from the hole and to lubricate the drill bit in much the same manner that water cools a dentist's drill.

But don't let the word "mud" fool you. Drilling contractors will spend $20,000 or more per well on drill muds alone. Naturally rig operators want to recycle as much mud as possible. But the accumulation of sand and abrasives in rotary drill muds raises havoc with drill bits and pumps.

Late in 1954 the Dorrco D-Sander was developed to remove the harmful sand from drill muds by using a battery of DorrClone units. Typical savings for a 10,000 ft. well . . . a 79% reduction in repair parts costs . . . a minimum saving of 15 hours per well in rig time . . . 25% longer bit life . . . 19% more feet per bit. Or translated into dollars — an average saving of $3,500 per well.

Removing sand and abrasives from rotary drill muds may be only of academic interest to you. However if you have problems involving any phase of the separation of finely divided solids in suspension . . . or ion exchange . . . or fluidizing technique — chances are that Dorr-Oliver and its world-wide organization can help you.

D-Sander is a trademark of Dorr-Oliver Incorporated.

DORR-OLIVER
INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U.S.A.

makes stripping quicker and easier and provides color-coding all the way through.

The new armored cable is available with two, three and four conductors in all standard sizes. The Underwriters' Laboratories rate it at 600 v. GENERAL ELECTRIC CO., CONSTRUCTION MATERIALS DIVISION, BRIDGEPORT 2, CONN.

Portable Generator Package

A new line of small, light-weight auxiliary power units has been introduced by Lear, Inc. The Model 5903 series is a completely self-contained gasoline-engine-driven generator package which supplies either 1,350 watts of dc power or 1,500 watts of 400-cycle ac power.

The machine weighs 35 lb and is completely contained in a package. Advantages include hand carrying the model to jobs. Fuel consumption is about 1 qt per kwhr. LEAR, INC., LEARCAL DIVISION, 3171 S. BUNDY DR., SANTA MONICA, CALIF.

Concrete Saw for Highways

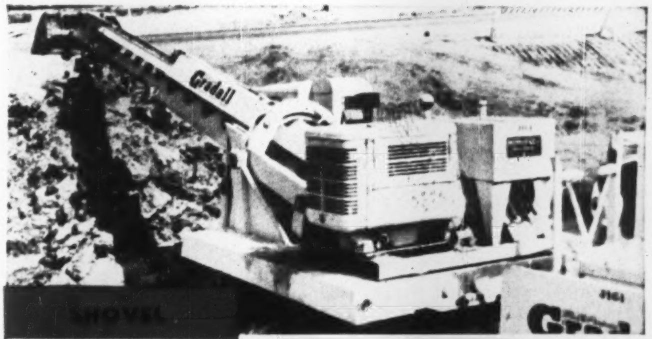
A new Eveready concrete saw, said to be designed particularly for production sawing on airfield installations and highways is now available.

The new machine—Model E-36 PD—has a 36 hp, 4 cylinder air-cooled engine, that can drive the saw under full loads at speeds up to 25 ft per minute. Two abrasive-coated drive wheels, in direct contact with solid rubber tires, give positive traction in any operating conditions. EVEREADY BRIKSAW CO., 1509 S. MICHIGAN BLVD., CHICAGO 5, ILL.

New Products Briefs . . .

Lightweight roto-trowel—A new model, lightweight, 3-blade trowelling machine, 29 in. in dia, is now on the market, aimed at the small contractor or builder doing cellar floors, patios, garages, etc. The machine is also popular with large contractors, since it can be put on a soft slab sooner than larger, heavier machines. STOW MANUFACTURING CO., 19 SHEAR ST., BINGHAMTON, N. Y.

Fuel injection—Suitable for any diesel engine, and said to result in more torque, more horsepower and longer engine use before overhaul, is the new Parker Fuel Injector. The injector is simple in operation and easy to mount on the crankcase panel of engines from 20 to 100 hp per cylinder. PARKER DIESEL ENGINEERING, 945 19TH AVE., OAKLAND 6, CALIF.



CRANE
Gradall

Gradall
LOADER

BACK-HOE
Gradall

SPECIFY International® Engine POWER

. . . Sized and Modified for contractors' needs

When this Warner & Swasey Gradall's hydraulic power system signals the International power for more "horses," response is lightning-fast.

International's high torque lugging ability is only one of many standard-equipment built-ins that give this heavy-duty power decisive advantages on multi-purpose machines such as the Gradall.

In addition, *already-engineered* modifications of International engines are available in a wide choice of combinations to fit a tremendous range of construction equipment applications.

These modifications range from dimension changes of components or units, to a matching up of performance characteristics desired for special applications.

One typical International engine, for instance, with correctly-specified modifications, powers an International crawler tractor—and 46 makes of loaders, compressors, asphalt mixers, pavers, excavators, generators, pumps, graders, and compactors.

Contractors in Terre Haute or Timbuctoo know and respect International power. You too, will find it pays to specify International engines as original or replacement power—pays in job efficiency and simplified maintenance. Backing up International power is one of the world's most experienced heavy-duty engine parts and service organizations.

The Warner & Swasey Gradall does trenching, grading, excavating, ditching, stockpiling, lifting, loading and many other heavy-duty construction jobs. When there's an International engine generating hydraulic power for the versatile Gradall, you can be sure of ample pump pressure and rugged dependability job after job.

INTERNATIONAL® CONSTRUCTION EQUIPMENT

[illegible]
[illegible]

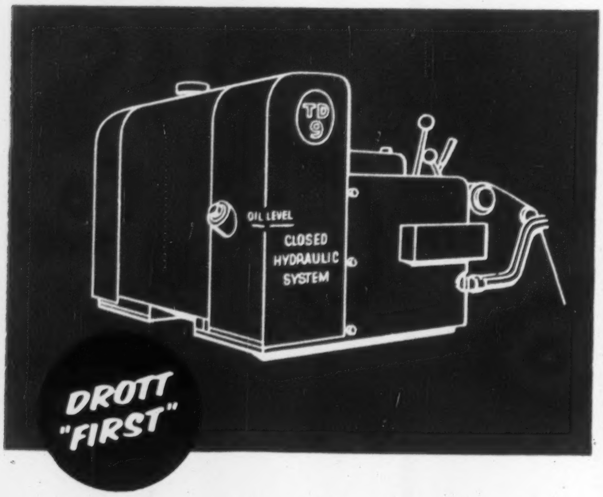
Choose from 18 heavy-duty International diesel and carbureted engines —from 17 to 214 hp.

**See you at the
CHICAGO
ROAD SHOW
Jan. 28 - Feb. 2, 1957**

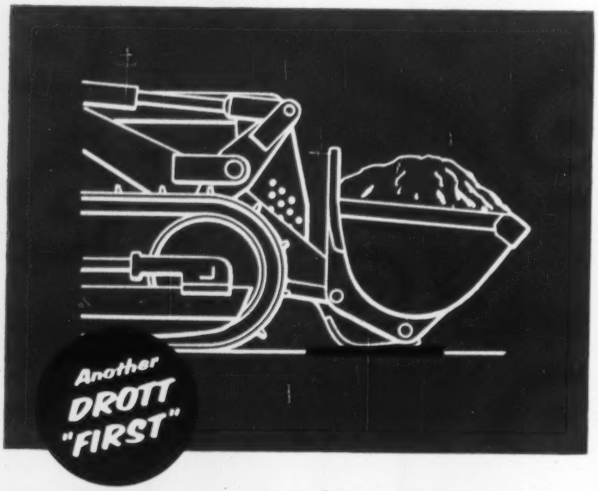
A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractors and Rubber-Tired Loaders . . . Off Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks.

HOW *YEARS-AHEAD* INTERNATIONAL® DROTT® "*FIRSTS*" *give you world-beating performance!*

Major design features behind world-beating International Drott machine performance are not "flash" inspirations—not hastily-contrived imitations—not spur-of-the-moment attempts to "catch-up." Instead basic Drott features are "originals"—with years of patient and productive *field* and *engineering* experience in their conception and development. *By owning Drott equipment, you get the big profit-advantages of years-ahead design and performance—right now!* Look at the record! Compare the results!

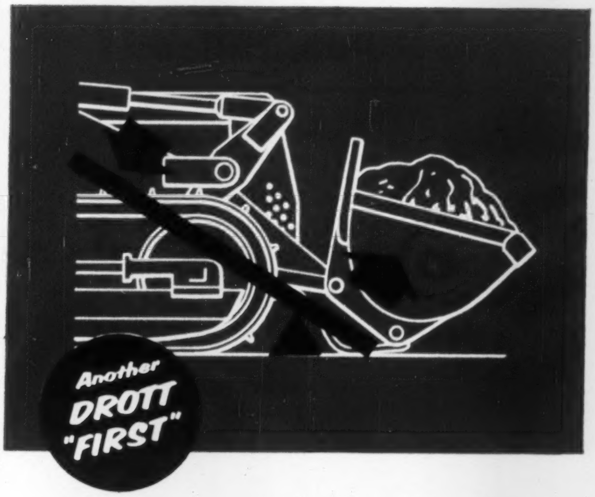

TD 9
OIL LEVEL
CLOSED HYDRAULIC SYSTEM
DROTT "FIRST"

SINCE 1937... Closed hydraulic system Excludes abrasives and other foreign material—reduces wear and simplifies servicing. Keeps oil in; keeps air and dirt out.

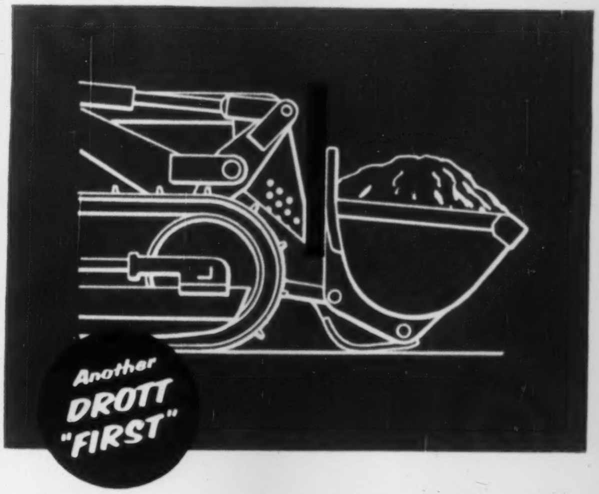

Another DROTT "FIRST"

SINCE 1944... Load transport on patented, exclusive, frame-mounted skid-shoes Prevents tractor "teeter-totter"; saves carry strain by "semi-skidding" heaped loads. Increases yardage.

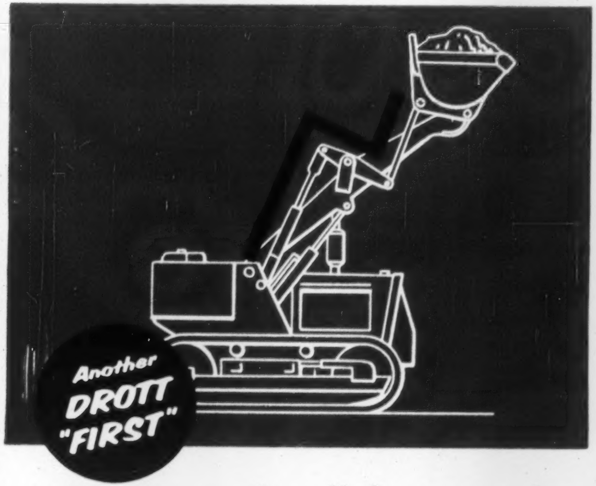
INTERNATIONAL DROTT
Another DROTT "FIRST"
4 1



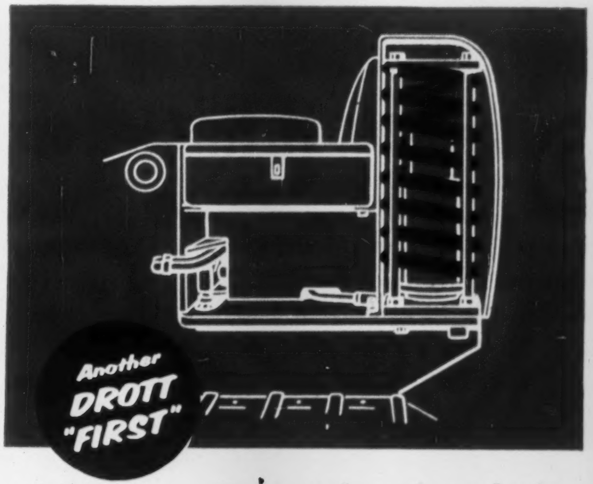
SINCE 1944 . . . Pry-action break-out Employs simple lever principle to give you *exclusive* triple-power digging force, ranging from 12,800 to 55,000 pounds! Shunts stresses into ground, so they can't maul bucket or tractor.



SINCE 1944 . . . Ground-level bucket roll-back Obtains heaped loads; *keeps the heap* to deliver extra yardage.



SINCE 1944 . . . Parallelogram raise action Keeps bucket at its 42° non-spill, roll-back level, all the way up. Increases yardage—avoids "spill-back."



SINCE 1946 . . . Patented and exclusive shock-swallowing hydro-spring Reduces effects of impact forces by 67%—to prolong equipment life, cut upkeep, reduce downtime, add operating comfort!

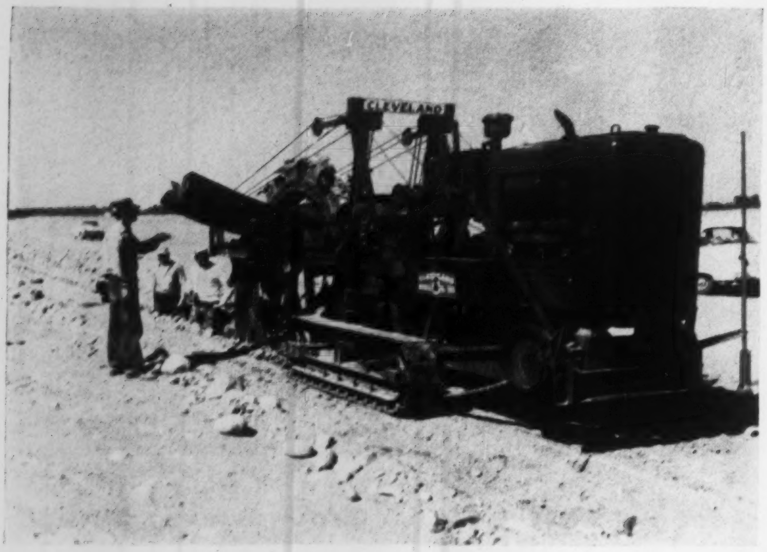
SINCE 1954 . . . Patented and exclusive DROTT Four-In-One Skid-Loader, bulldozer, Bullclam, clamshell, all in one —4-machine utility, one moderate investment. Now in 3 sizes, 1 yard to 2¼ yard capacity.

International Drott "firsts" like these combine to give you money-making performance and value *not available elsewhere*. You can prove it to your *satisfaction* and *profit*, by demonstration. See your nearby International Drott Distributor!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 8, Wis.

IH® INTERNATIONAL HARVESTER

INTERNATIONAL® DROTT®



Cleveland® "95" digs 10 miles for airfield lighting system at Portsmouth, N. H. Air Force Base

Morrison-Knudsen Company, Inc. and Landers & Griffin, Inc. employed a Cleveland Model 95 "Baby Digger" to good advantage in the construction of the airfield lighting system for the Strategic Air Command's 4,500-acre, $60,000,000 Jet Base at Portsmouth, N. H. The Cleveland dug approximately 52,000 feet of trench 17 inches wide by 27 inches deep for the installation of cable and duct.

The "Baby Digger" was also profitably used on the same project for the excavation of some 3,600 feet of underdrain pipe trench, approximately 2 feet wide by 5 feet deep. As the photograph above shows, much of this trenching was done in rocky, stony soil, definitely not what could be termed "easy going."

The dependable Cleveland steadily delivered good daily trench footage—as it had been counted upon to do—in spite of the rugged digging and adverse conditions encountered. Just another example of Cleveland's ability to *dig more trench . . . in more places . . . at less cost.*

Talk it over with your Cleveland distributor

THE CLEVELAND TRENCHER COMPANY • 20100 St. Clair Ave., Cleveland 17, Ohio

CLEVELAND®

Publications

Using explosives—A report on drilling and blasting methods for quarries lists procedures in 106 typical case histories. The bulletin—listing formations, stratifications, drill and explosive types, etc.—was compiled by the American Cyanamid's technical service staff. American Cyanamid Co., 30 Rockerfeller Plaza, New York 20, N. Y.

Mining-and-contractors' tools—A new second edition, catalog No. 44, listing Thor Power Co.'s complete line of tools is now available. This 68-page book is printed in two colors and is three-hole punched for easy insertion in ring binders. Lead-off pages of each section show schematic drawings of the basic tools that are to be described with complete information and specifications. Thor Power Tool Co., Aurora, Ill.

Rubber products—A 12-page color catalog listing mechanical rubber products for construction has just been released. Dredging, steam, concrete, fire- and water-hose, belting, V-belts, packing and tape are among the products described in the new catalog. Cutaway views and photos of each product plus sections on the various types, sizes, diameters, are also included. Dept. 3391E, Boston Woven Hose & Rubber Co., P. O. Box 1071, Boston 3, Mass.

Rear-dump truck—A new eight-page catalog describes the new R-15 rear-dump Euclid. Rated payload of the unit is 15 tons with standard 14.00 x 24 tires, 18 tons with optional 16.00 x 25 tires. Also illustrated are major designs and operating features of the rear-dump model for off-highway hauling plus general specifications and performance data. Euclid Division, General Motors Corporation, Cleveland 17, Ohio.

Glass fiber goes to school—A two-color 28-page brochure describes and illustrates Fiberglas products for construction and maintenance of schools. Shown in the booklet's 11 sketches, 56 photos and 2 charts are the many roles that Fiberglas can play. Some of the applications described are school furniture, noise-control, form board, roof insulation, and reinforced gypsum wallboard. Owens-Corning Fiberglas Corp., Toledo 1, Ohio.

Contact lath ceilings—A ceiling in which the metal lath is secured in

The Problem.....Move 16,000,000 Yards of Rock, Marine Clay, Boulders and Heavy Earth

again the answer was......

Firestone NYLON TIRES

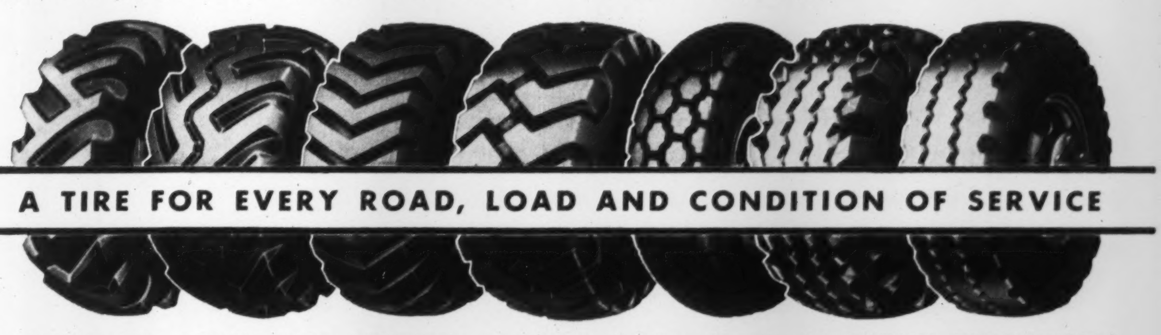
In excavating the marine channel on Galop Island in the St. Lawrence Seaway, millions of yards of heavy boulder-strewn glacial till are being moved under the toughest haul road conditions.

The Galop Island project is well on its way and as on other Seaway jobs, Firestone nylon tires is the answer because they are tougher tires. They cut big downtime losses, give more retreads and keep tire costs at a minimum.

Firestone nylon tires are built for severe service. The treads give maximum traction and they are extra tough to resist cutting. Double-thick sidewalls give added protection against cuts and snags.

Firestone's Safety-Tensioned *Gum-Dipped* nylon cord body gives greatest protection against impact breaks . . . flex breaks . . . heat failures . . . and water damage.

Let your Firestone Dealer or Store show you how Firestone nylon tires will cut downtime and increase the profits on your job.



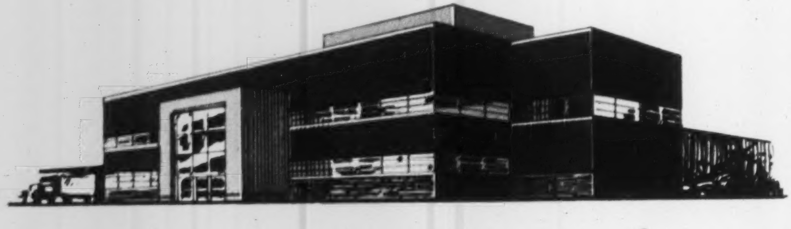
GROUND GRIP GG WIDE BASE ROCK GRIP RG WIDE BASE ALL NON-SKID ALL TRACTION RIB EXCAVATOR

WHEN YOU BUY NEW EQUIPMENT OR REPLACEMENT TIRES, *SPECIFY FIRESTONE*

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

Copyright [illegible], The Firestone Tire & Rubber Co.

Now add Beauty



to low-cost, maintenance-free roofs and sidewalls with Color Galbestos

Robertson's fifty years of pioneering in the protected metal industry, teamed with its extensive program of research at famed Mellon Institute of Industrial Research has perfected a protected metal with built-in beauty. Now you can have Galbestos in colors!

All of the time-tested advantages of a long, maintenance-free service life, resistance to fire, corrosion and extreme weather conditions that have made Robertson the world's standard of steel protection for over fifty years are now available in four new attractive colors . . . red, green, buff and gray in addition to the familiar black and maroon.

Roofs and sidewalls of Color Galbestos bring the much desired element of color to industrial and commercial buildings at a lower cost than any other means. These new colors, used singly or in combinations, open a whole new field of functional beauty to building owners and designers.

ROBERTSON Color Galbestos

H. H. Robertson Company

2420 Farmers Bank Building • Pittsburgh 22, Pennsylvania
In England—Robertson Thain Ltd., Ellesmere Port, Cheshire
In Canada—Robertson-Irwin Ltd., Hamilton, Ontario

Please send additional information on Color Galbestos.

NAME TITLE

COMPANY

ADDRESS CITY

direct contact with the construction above without the use of runner channels or furring, is defined as a contact metal lath ceiling. A 4-page bulletin, which includes detail drawings, discusses methods of attaching metal lath directly to the underside of steel, concrete or wood, and tabulates the types and weights of metal lath, as well as their fire-resistive ratings. METAL LATH MANUFACTURERS ASSOCIATION, ENGINEERS BUILDING, CLEVELAND 14, OHIO.

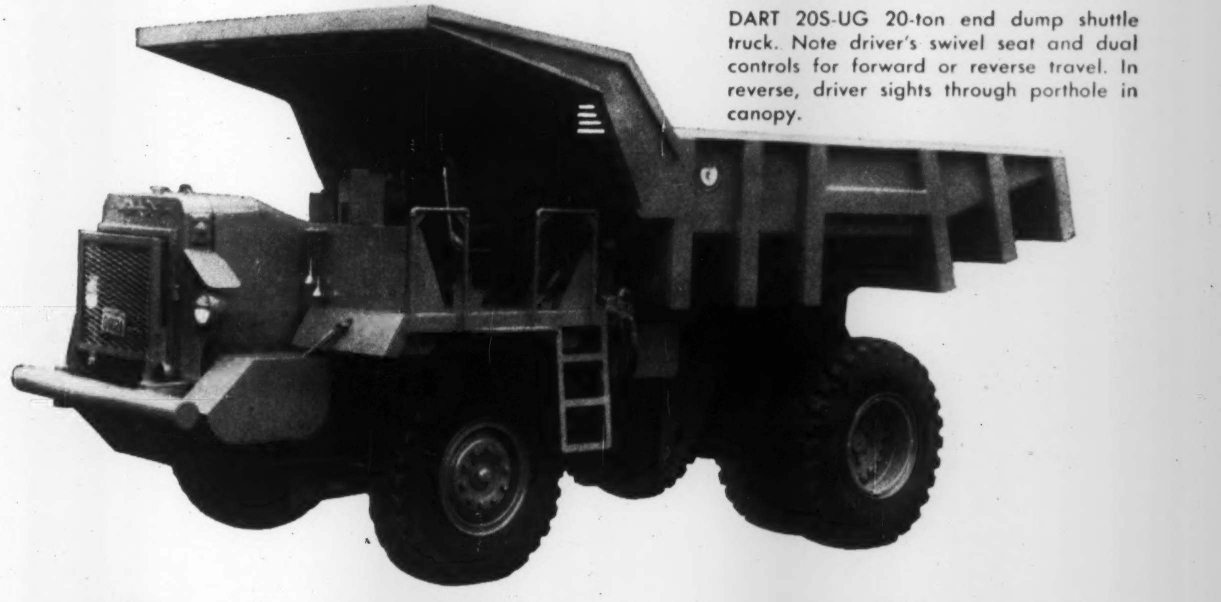
Electric tools—A 44-page catalog describes and illustrates Silver Line and Speed Tool electric tools. THOR POWER TOOL CO., AURORA, ILL.

Rollers—Bulletin No. S-72-156 illustrates heavy-duty variable weight three-wheel rollers. The VM-31D's and VM-32D's power-roll brakes, tapered roller bearings on all rolls, compact four-speed transmission, are a few of the many features that are described in this 12-page bulletin. BUFFALO-SPRINGFIELD ROLLER CO., SPRINGFIELD, OHIO.

Steel-frame form panels—By means of photographs and detail drawings, a new 14-page booklet describes the advantages, erection, applications, accessories and the removal of Atlas Compo Forms. Available in many widths, and up to 8 ft in height, these are prefabricated rectangular form panels. They consist of a high-tensile steel frame backing a plastic coated plywood panel. IRVINGTON FORM AND TANK CORP., 20 VESEY ST., NEW YORK 7, N. Y.

Corrugated metal forms — An illustrated 12-page booklet gives detailed information on "Corruform", a high-strength steel corrugated form that is available in three finishes, as well as three weights, depending on the span. Given in the booklet are Corruform's uses, its advantages, where it has been installed to date, how to select, suggested specifications, applications in roof construction, typical details, and attachments. GRANCO STEEL PRODUCTS CO., 6506 N. BROADWAY, ST. LOUIS 15, MO.

Water Lines—The ninth annual issue of "A Report of Dresser-Coupled Steel Water Lines" carries construction details on principal steel water lines laid during the past year. The lines described vary in diameter from 4 to 67 in. and are reported from all over the world in a 12-page booklet. DRESSER MANUFACTURING DIV., BRADFORD, PA.



DART 20S-UG 20-ton end dump shuttle truck. Note driver's swivel seat and dual controls for forward or reverse travel. In reverse, driver sights through porthole in canopy.

OIL from ROCKS VIA 4 DART TRUCKS

For use in its experimental shale oil plant at Rifle, Colorado, the U. S. Bureau of Mines recently put to work four custom-built DART Trucks. The shale mines are underground and the trucks are specially designed to negotiate sharp corners and close quarters. The trucks are driven into the mine backwards and after loading, driven out in forward gear. Then there's a long road-haul to the processing plant. Unusual performance is required. The trucks are powered by 225 HP Diesel engines with Twin-Disc Torque Converters and Fuller 4-speed transmissions. The rock-type body, with removable cab protector, has a capacity of 15 cubic yards.

172,400 pounds of DART Trucks lined up to carry more than 80 tons of oil-bearing shale. With a wheelbase of 126", the trucks turn in a radius of 28'.

Ease of handling the big trucks is a boon to the operators. Hydraulic steering, air brakes and dual controls for shuttling eases the job, adds safety.

Up goes 20 tons! Twin 7½" diameter double acting, two-stage Hydreco hydraulic hoists provide fast and positive dumping.

DART TONNAGE ENGINEERED TRUCKS

Kansas City 8, Missouri

SUBSIDIARY OF THE CARLISLE CORPORATION

D-116

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PLYWOOD CORPORATION

ABERDEEN
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HARBOR PLYWOOD CORPORATION ENR-6
ABERDEEN, WASHINGTON

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concrete form panels
...cost less than a penny per poured surface foot!

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AVERAGE NUMBER OF RE-USES	10	40	
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*Prices vary in different areas.

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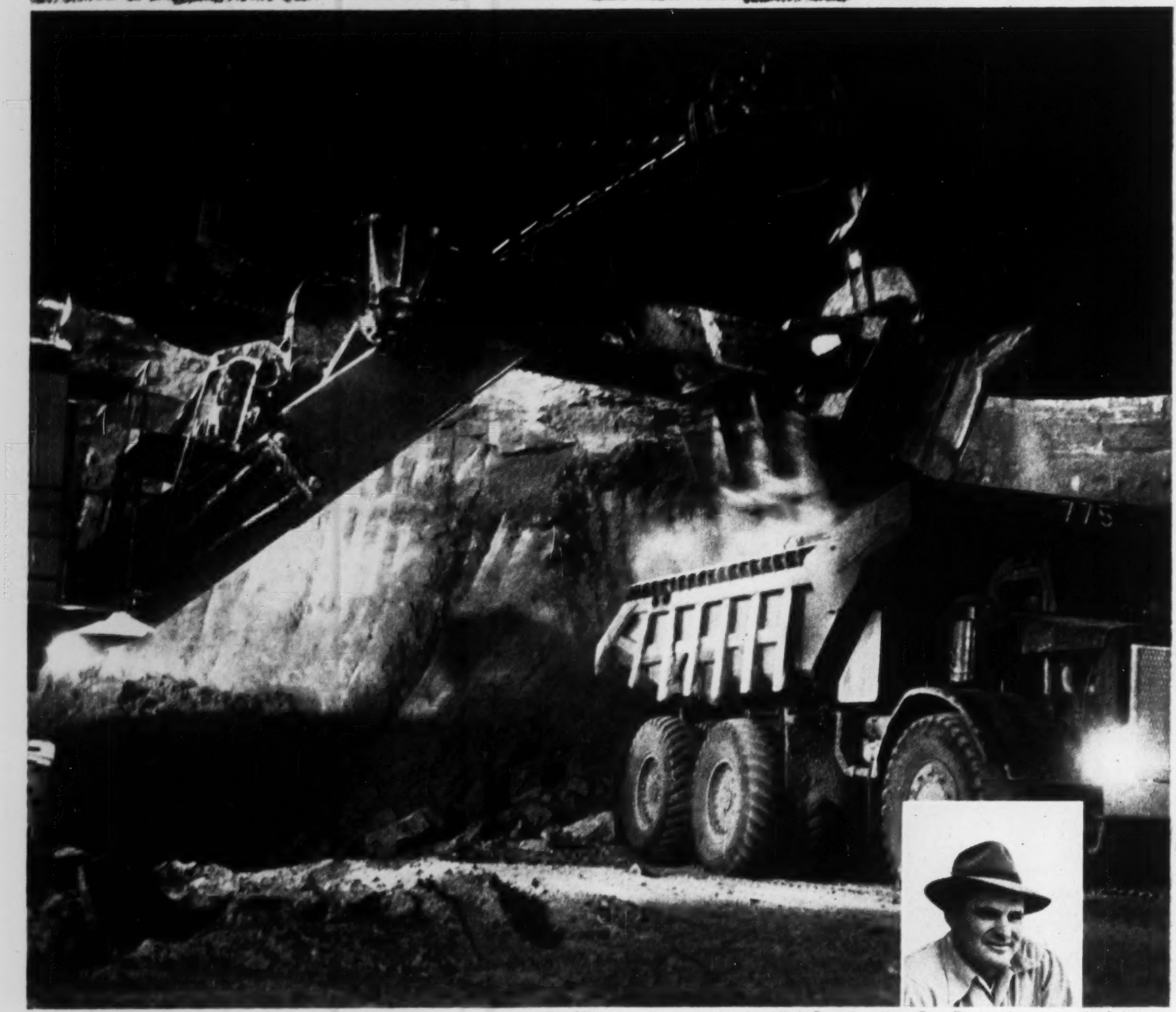

Bill Martin, master mechanic, Utah Construction Co., Pima mine project, Arizona

"Union lubricants...keep 'em rolling day and night"

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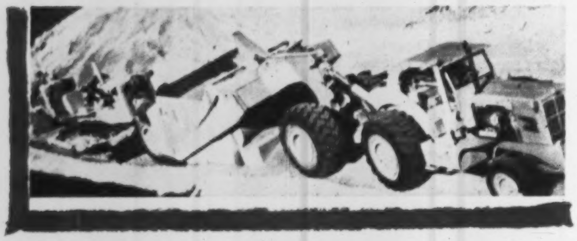

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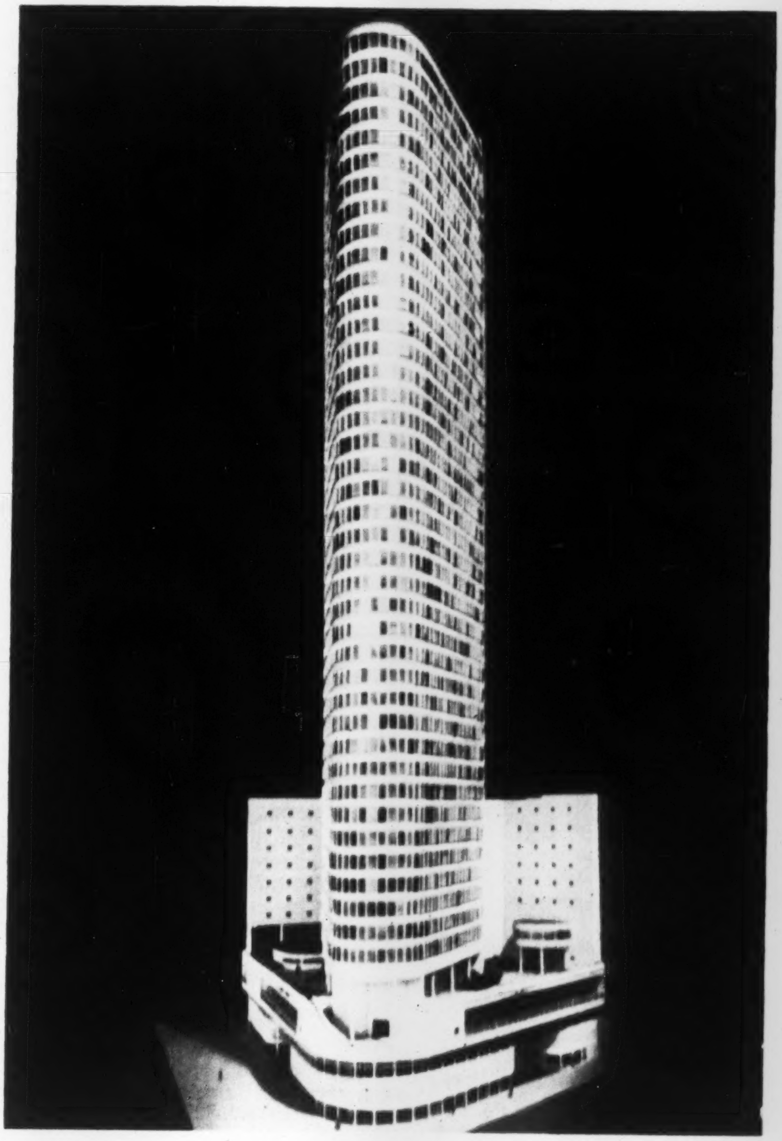

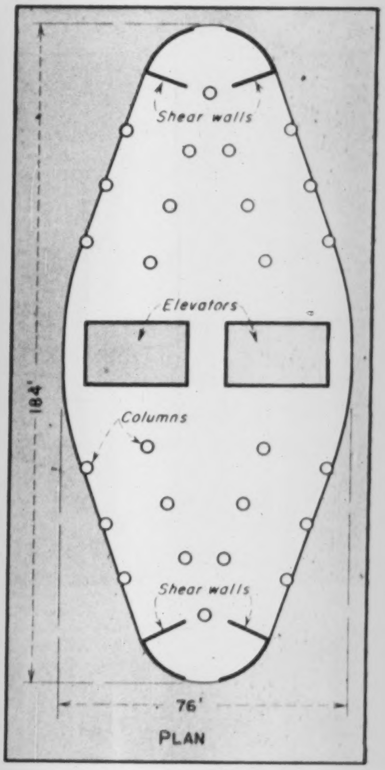

For Brazil . . .

The Tallest Concrete Building

Shaped like one of the stacks of a giant ocean liner, a new concrete building under way in Sao Paulo, Brazil, will tower 45 stories (443 ft) above one of the city's busiest intersections when it is completed about 1960. By so doing it will steal the world's height record for concrete buildings from a 41-story office structure in Buenos Aires, which will be completed in July.

To be called the Italia Building, the elliptical-plan building will have a major axis of 184 ft and a minor axis of 76 ft. It will require 17,000 cu yd of concrete, and 1,543 tons of reinforcing steel. Exterior will be glass, mosaic tile and aluminum. Cost of the building is estimated at $40 million.

The new skyscraper will be supported at its base by 48 cylindrical concrete caissons, 10 ft in dia and 100 ft deep. Each of these is calculated to support 5,520 tons.

To take advantage of its airfoil shape, the building is faced into the prevailing winds. For strength against other winds, the architect is relying on 26 cylindrical concrete columns, walls around two elevator shafts and four shear walls—all of which extend the full height of the building.

The first five floors of the building comprises a base section, 23,200 sq ft in area above which the tower rises. These floors are to be occupied by an Italian club, per a concession granted by the builders in exchange for the land rights to a corner of one of Sao Paulo's busiest downtown intersections.

The funnel-shaped tower section will consist of 40 floors of office space. Since there is no fixed interior wall design, office renters may arrange their space any way they desire.

To provide a flexible interior, water and electric distribution lines had to be designed accordingly, as did the drainage system. Electric distribution

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used to reduce cost of construction of parking garage

Parking Garage, Philadelphia Parking Garage Authority, Phila., Pa.
McClosky and Company, General Contractors.

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for round columns of concrete

This structure contains both 36-inch and 32-inch round concrete columns formed by low-cost SONOTUBES.

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You save money on formwork and time and labor, too, when you use SONOTUBES to form round columns of concrete!

SONOTUBE Fibre Forms are being used from coast-to-coast in the construction of parking garages as well as for piles, piers, underpinning and columns in a wide variety of structures.

SONOTUBE Fibre Forms are available from 2" to 36" I.D. up to 50' long. Order in specified lengths if you desire.

Use Sonoco's patented "A-Coated" SONOTUBES for finished columns; wax-coated also available.

Use SONOTUBES on your next job and save time, labor and money!

For complete technical information and prices, write

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will come up the building via two main lines. Header lines, connected to these, circumscribe each floor. Outlets will be located at 6½-ft intervals along the outside wall.

Water distribution and drainage will be handled in the same manner, only there will be four primary water mains running up the sides of the building. Thus, each office will have its own electric, water and sewer outlets.

The building's four elevator shafts will accommodate twelve elevators.

Architect for the record structure is Franz Heep, chief engineer is Gaston Kuhn. Engineers are Otto Meinberg Engineering & Construction Co. of Sao Paulo.

Indo-Kashmir Tunnel Link Pass Three-Quarter Mark

Three-fourths of the 8,200-ft Banihal tunnel, being cut through at the 7,000 ft level to give the Kashmir valley an all-weather link with India, is ready, and traffic flow in both directions is expected to get started at the end of this year.

This $8-million construction job, undertaken by the German firm of Baresel & Kunz, consists of twin tubes, each 18 ft in dia.

The present motor road also traverses a tunnel, but crosses the 9,000-ft Banihal Pass, which is blocked by snow during the winter months. During this period, the Kashmir Government moves down to Jammu and the valley is dependent on air transport.

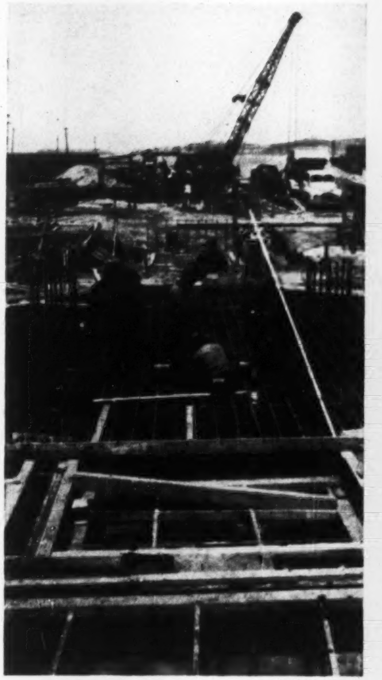
The existing tunnel and road is being repaved by the German firm.

$19.4-Million World Bank Loan Goes for Burma Improvements

Armed with two World Bank loans totaling $19.4 million, the Government of Burma this week was ready to begin a major program to rehabilitate and improve its sea and rail transport facilities.

Biggest of the two loans—for $14 million—was made to the Commissioners of the Port of Rangoon, to finance reconstruction of cargo berths and storage facilities damaged during World War II, and for purchase of dredges, tugs and other equipment. The second loan, of $5.4 million, was made to the government itself, to pay for freight cars, engines and bridge construction materials for a rehabilitation and development program by the Burma railways.

A bank announcement said that improvement of transport generally is of high priority in plans of the



EPS photo

Industry for Korea

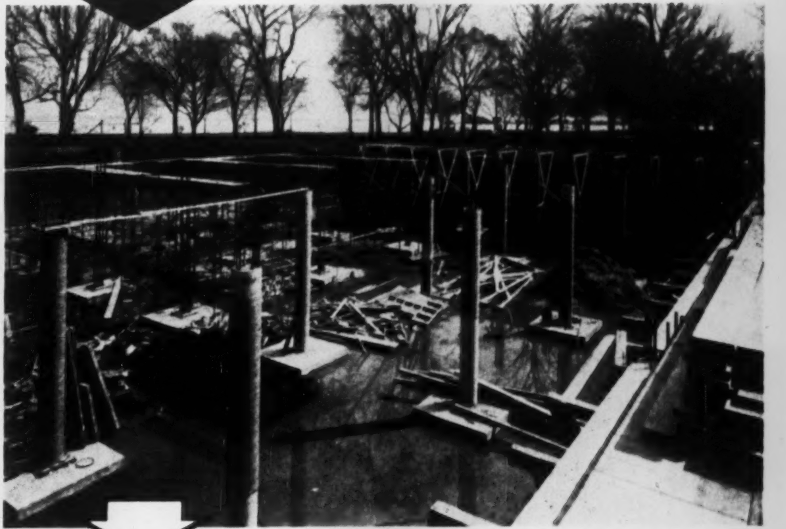
Nearing completion at Inchon, Korea, is the nation's first flat glass plant, being built under the aegis of the United Nations Korean Reconstruction Agency. The $2.5-million plant will be capable of producing 12,000,000 sq ft of flat glass annually—enough to meet Korea's normal needs. Contractor is Vinnel International Corp., Alhambra, Calif.

Burmese government. Rangoon handles four-fifths of the country's foreign trade, but its efficiency has been much hampered by hastily repaired facilities, and lack of storage and rail space.

Underwater Tunnel to Link Two Argentine Provinces

The stage has been set for a $19-million toll tunnel under the Parana River in Buenos Aires, to join the capital cities of the provinces of Entre Rios and Santa Fe. Construction of the project is due for completion in 1959.

The tunnel, which is to be more than a mile long, will contribute to the development of the three provinces of Entre Rios, Corrientes and Misiones. This area is bounded by waterways, which have kept it in virtual isolation from the rest of the country and Uruaguay, Paraguay and Brazil.



SONOTUBES®

save many man-hours of construction time

Water Supply Plant, Wyandotte, Mich. Pate and Hirn, Architects and Engineers. Edward Schendel, Contractor. Photo by Win Brunner.

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for round columns of concrete

Round concrete columns from the ground up for this water supply plant . . . all formed by low-cost SONOTUBES!

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SONOTUBES take less time to erect because they require minimum bracing . . . SONOTUBES are economical to use because they are low in cost. Minimum finishing time is required because SONOTUBES strip easily when recommended methods are followed.

SONOTUBE Fibre Forms are approved by architects and engineers everywhere and are widely used by contractors.

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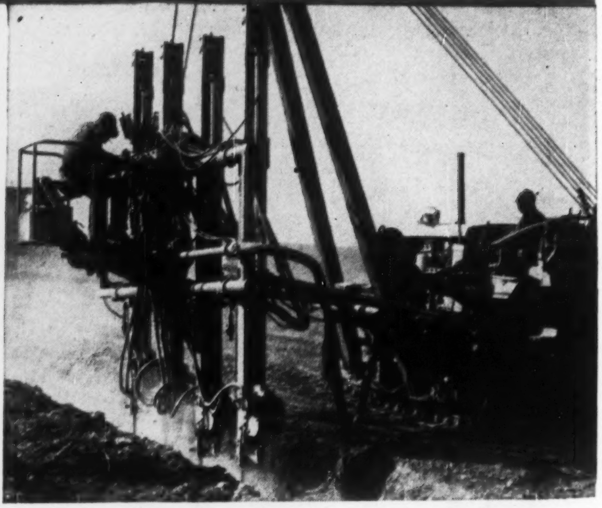

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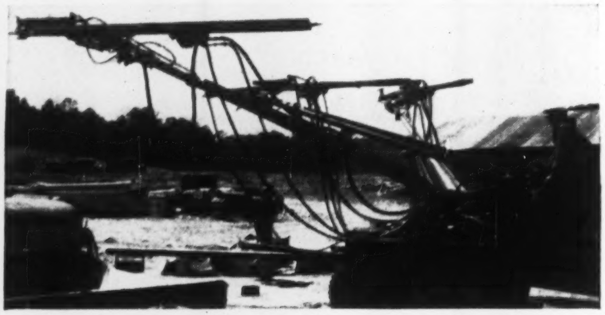
Self-propelled "Air Trac"® drill for rough terrain.



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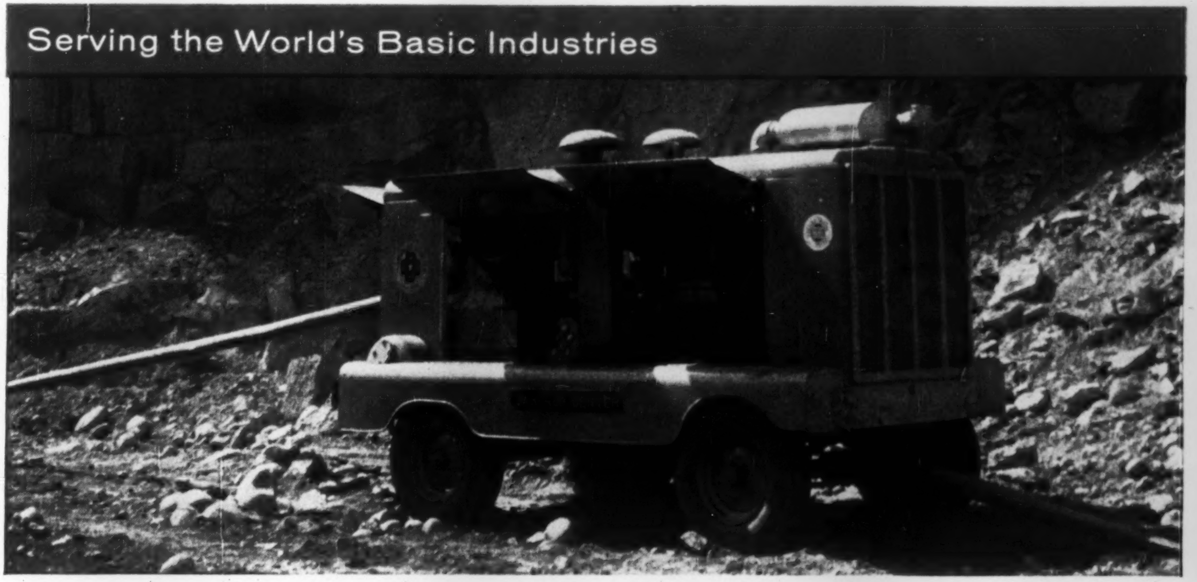
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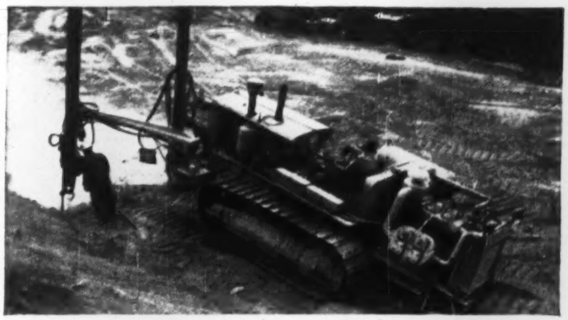
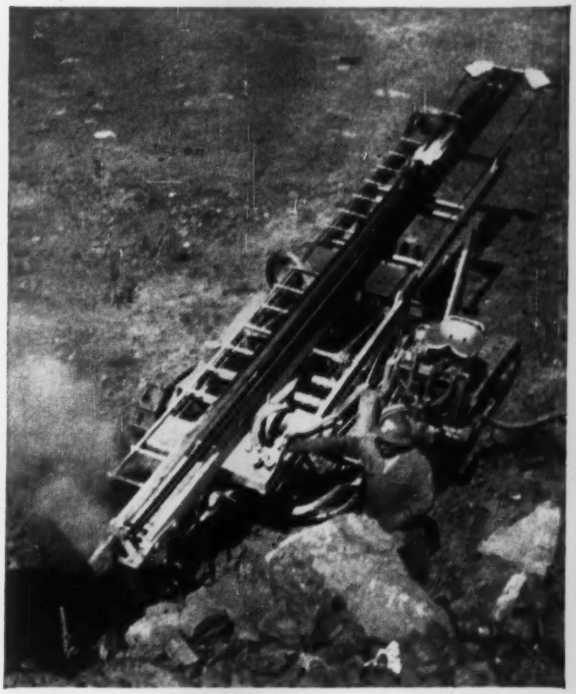

Tractor-mounted drills with hydraulic booms, and compressor.

Long-feed tunnel drills and hydraulic booms.


New 5½" heavy-duty rock drill on self-propelled crawler.

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Books

New Engineering Books

FROM THE GROUND UP—Observations on Contemporary Architecture, Housing, Highway Building, and Civic Design—by Lewis Mumford. 243 pp. Harcourt, Brace & Co., 383 Madison Ave., New York 17. $1.25.

ELECTRONS, WAVES AND MESSAGES—by John R. Pierce. 318 pp. Hanover House, 575 Madison Ave., New York 22. $5.00.

STREAMLINED SPECIFICATIONS STANDARDS—Volume 2: Mechanical and Electrical. 494 pp. Reinhold Publishing Corp., 430 Park Ave., New York 22. $10.00.

MIRACLE OF WORLD WAR II—by Francis Walton. 575 pp. Macmillan Company, 60 Fifth Ave., New York 11. $7.50.

BITUMEN IN HYDRAULIC ENGINEERING—by Baron W. F. van Asbeck. 154 pp. Shell Petroleum Company, Ltd., London, England.

Reports and Pamphlets

PLASTICITY AND WATER RETENTIVITY OF HYDRATED LIMES FOR STRUCTURAL PURPOSES—Building Materials & Structures Report 146. Superintendent of Documents, U. S. Govt. Printing Office, Washington 25, D. C. 15c.

A STUDY OF STEPPED CONCRETE FOOTINGS—by Clayton M. Crosier. Bulletin of Engineering and Architecture No. 33. University of Kansas, Lawrence, Kans.

PEACEFUL USES OF ATOMIC ENERGY—Volume I. U. S. Government Printing Office, Washington, D. C. $2.00.

SOUND INSULATION OF WALL, FLOOR AND DOOR CONSTRUCTIONS—by Richard V. Waterhouse. Supplement to Building Materials & Structures Report 144. Superintendent of Rep. & Pam. Documents, U. S. Govt. Printing Office, Washington 25, D. C. 5c.

PLASTICITY AND WATER RETENTIVITY OF HYDRATED LIMES FOR STRUCTURAL PURPOSES — Building Materials and Structures Report 146. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 15c.

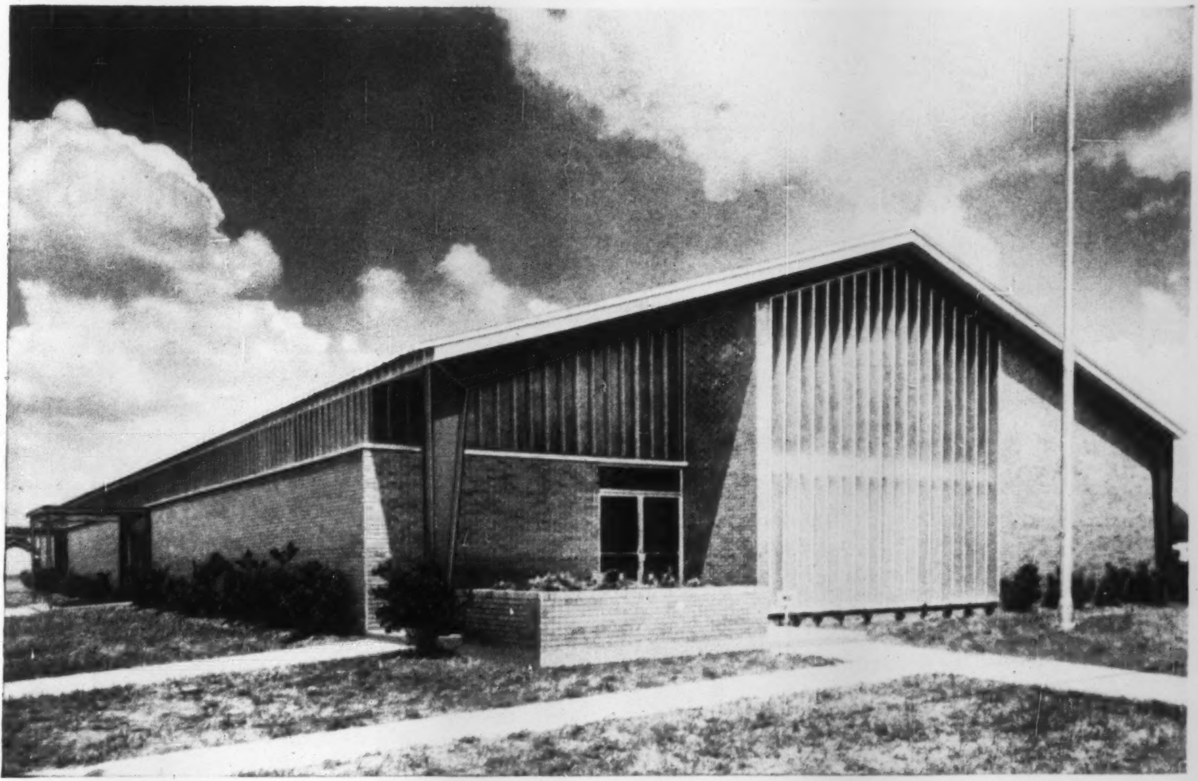
MANUAL OF TILT UP CONSTRUCTION—Fourth edition. F. Thomas Collins, P. O. Box 208, San Gabriel, Calif. $12.50.

DIGEST OF SEWERAGE ENABLING ACTS OF THE STATE OF CALIFORNIA—State Water Pollution Control Board, Room 610, 721 Capitol Ave., Sacramento 14, Calif. 50c.

DIRECT UTILIZATION OF WASTE WATERS—State Water Pollution Control Board, Room 610, 721 Capitol Ave., Sacramento 14, Calif.

THREE AND FOUR BEDROOM HOMES—Homes for Living, Inc., Macy Building, Jamaica 32, N. Y. 50c.

WATER POWER RESOURCES OF CANADA—Bulletin No. 2501. Director, Water Resources Branch, Dept. of Northern Affairs and National Resources, Ottawa, Canada.



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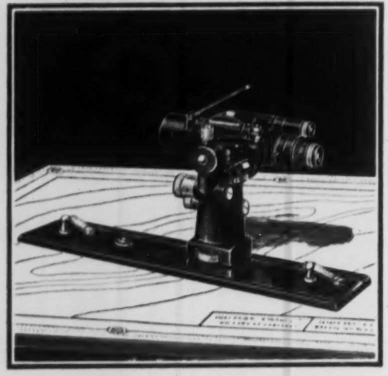

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DIETZGEN

New Analysis Pinpoints Detergents Present in Water, Sewage Plants

A method of analyzing quantitatively the suspected chief troublemaker in detergents relating to water and sewage treatment will soon be published by Association of American Soap & Glycerin Producers, Inc.

The existing Methylene Blue procedure fails to determine accurately the minute amounts of alkyl benzene sulfonate, or ABS, the surface active agent most commonly employed in detergents. With the basic measurement tool about to be provided, researchers will be better able to study ABS in relation to frothing and extent of biochemical degradation.

Soap industry spokesmen claim, however, that at this time ill effects of detergents in treatment plants have not been proved; there is insufficient evidence to draw any valid conclusions.

The new method involves the measurement of ABS first by removal of the ABS by adsorption on activated carbon. This begins to sort out the ABS from larger amounts of other organic matter present. ABS is removed from the carbon column, followed by a further sorting out by chemical methods. When a sufficiently large quantity of pure ABS has been obtained, it is measured qualitatively and quantitatively by an infrared spectrophotometer.

As now evolved, the method is not practical for use by the average sewage and water treatment plant operator, but a simpler method is being worked on by AAS&GP. The Robert A. Taft Sanitary Engineering Center of U. S. Public Health Service is also studying a shorter procedure, as is the Monsanto Chemical Co.

The soap association has recognized the same lack of adequate analysis methods for the other constituents of detergents suspected of causing difficulties in treatment plants. The complex phosphates that are employed in detergents as builders have been accused of retarding coagulation and sedimentation in water treatment plants. While agreeing that the phosphates could do so if present in sufficent concentration, detergent producers feel the amount of phosphates that reach the purification plant are quite minute and they are now at work on an analysis method to prove the situation.

• **Sponsor independent research**—In addition to research by its own task forces, the Association has raised $128,000 that is now sponsoring research work at four universities.

Ross E. McKinney, Clair N. Sawyer and Rolf Eliassen at MIT are studying the possible biochemical degradation of surface active agents in detergents.

At the University of Californa at Berkeley, E. S. Grosby and P. H. McGauhey are making a comprehensive study under a wide range of conditions, of the fate of ABS in sewage treatment plants and in surface water supplies.

Causes and prevention of frothing in sewage plants are being researched by G. A. Rohlich and L. B. Polkowski at the University of Wisconsin.

Proving and using the AAS&GP method of analyzing for complex phosphates for further study are J. C. Dietz and R. S. Engelbrecht at the University of Illinois. They have set up a pilot plant to observe the settling operation in water treatment works.

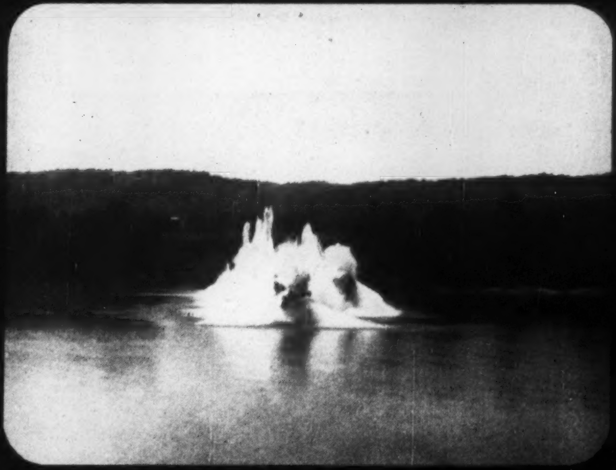
In its quest for resolution of the effects of detergents in water and sewage treatment, the soap producers are working closely and effectively, with several state, interstate and federal water and pollution regulatory agencies. Their first opportunity occurred in 1951 when the sewage treatment works in San Antonio, Texas, developed a froth about 8 ft high. Experiments showed that the froth could be made to disappear simply by raising the suspended activated sludge above a critical level of 1,400 ppm. At a high solids level of 3,500 ppm, as much as 250 ppm of packaged detergent product did not create frothing.

The San Antonio experience was followed by difficulties in New York, Philadelphia and Los Angeles, which received much publicity in the technical and lay press. It became obvious that the soap industry would have to take bold steps if it did not want accepted by default the unproved charges that detergents were to blame. The research work described herein was thus borne of that situation.

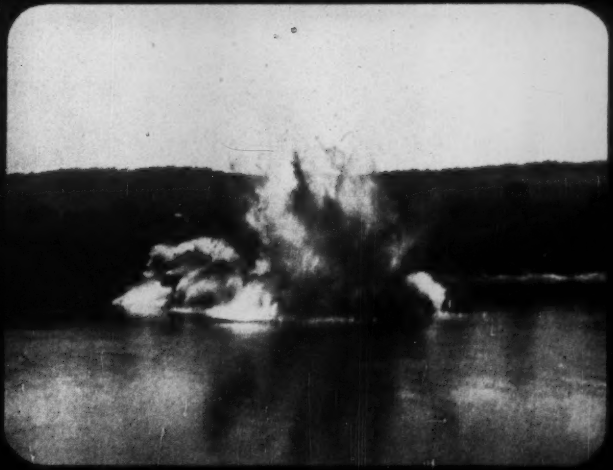
Details of the new ABS analysis method may be obtained from AAS&GP at 295 Madison Ave., New York, N. Y.

"A good, clean ditch . . . ready for the pipe!"

This is the blast site: the Ohio River near Greenup, Ky. The job: dig a good, clean ditch for a pipeline crossing. The shot: second in a series of three . . . this one from the Kentucky shore. The method: blast it with Atlas explosives and modern techniques.



Excellent shot! Blast lifts shattered sandstone and limestone from river bottom . . . throws muck clear of ditch. Contractor will not be held up for clean up on this job.



Blast at its height shows tremendous heaving power of Atlas explosives, properly applied. The river crossing was a huge success . . . pipeline pushed through right on schedule.

Another successful river crossing shot . . . *with Atlas Explosives!*

Look at the way the rock flies. Up and out! High and clear! That's efficient shooting. Pentzien, Inc., Omaha, Neb. is crossing the Ohio . . . and it's Atlas all the way. Here's a good clean ditch . . . ready for the pipe.

When you're contracting a pipeline job, you can't afford the time or expense for secondary "clean up" shooting. Tight schedules demand you shoot it right the first time. So whenever you can, it pays to shoot it carefully and thoroughly. Pennies extra for explosives can mean dollars saved on the job.

Before your next blast, why not go over your specific problems with your Atlas representative? He'll help you get the most out of your blasting methods, your explosives and your caps. And get "Better Blasting"—Atlas' informative newsletter on latest methods and materials. Write us today.

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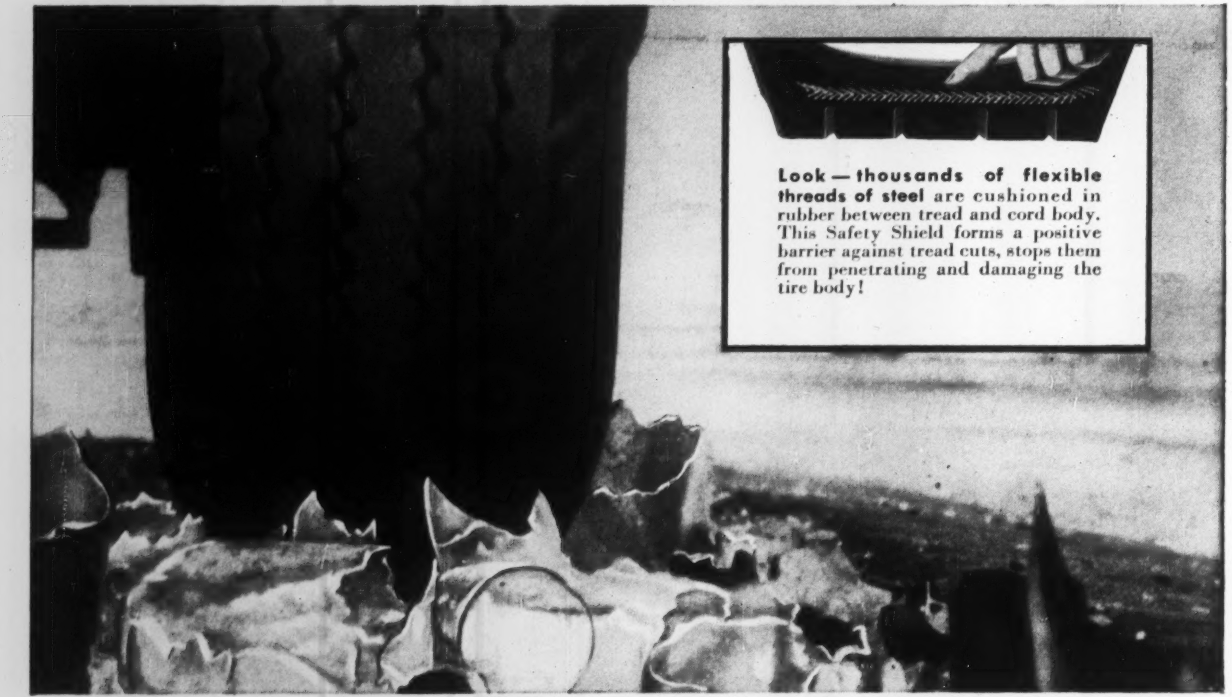

Look — thousands of flexible threads of steel are cushioned in rubber between tread and cord body. This Safety Shield forms a positive barrier against tread cuts, stops them from penetrating and damaging the tire body!

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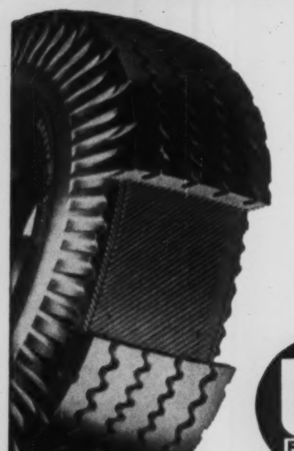

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You'll find new U.S. Royals like this cost *surprisingly little*. Ask your U.S. Royal Dealer now. And remember—you can specify them on the new equipment you buy!

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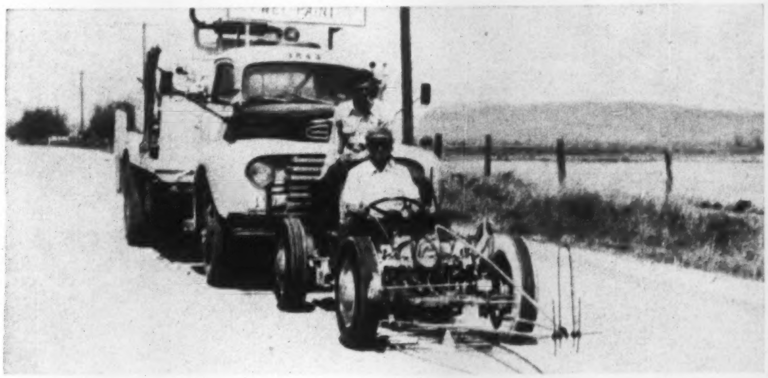
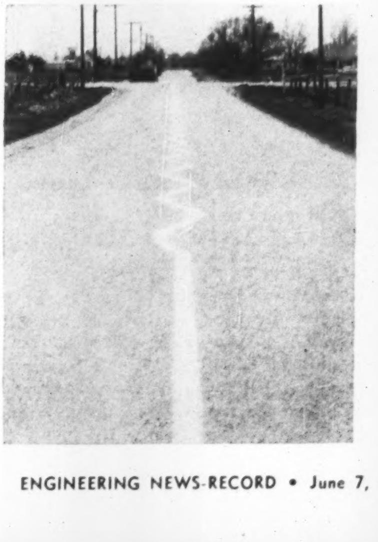


"Snake Stripe" Goes On by Machine

When Idaho's State Highway Department adopted the "snake stripe" —wavy centerline—as a method of warning motorists that they were approaching a stop street, they found it effective but costly and time consuming, since the layout and painting had to be done by hand.

Fred Jacobson, a department machinist, however, developed a lightweight striping unit that attaches quickly and easily to department paint carts. The unit, constructed mostly of aluminum, is powered by one front wheel of the paint cart, and through a worm and gear, ballcrank and sliding link, moves a paint gun laterally back and forth to describe a sine curve as the cart moves straight forward along the centerline.

On tangent approaches, only two markers are necessary, one at the beginning point and another at the terminal point of the line. Formerly, a 500-ft line, with knots at 5-ft intervals, was stretched along the centerline, and 8-in offsets were marked alternately left and right. Finally, the snake stripe was painted with a hand-guided carriage-mounted spray gun. The machine has, in its present form, shaved 15 min from total time required to mark each approach section —it moves at 8 mph—and it has removed the possibility of injuring an operator walking in front of the paint truck.



While the attachment has been highly successful, the department is working on a new model even less complicated, and may even add an air ejector that will apply glass beads to newly painted stripes.

According to E. V. Miller, state highway engineer, drawings and additional details are available to interested highway agencies who write to the Maintenance Engineer, Idaho Department of Highways, P.O. Box 879, Boise, Idaho.

Two Portable Earth Augers Tested by Corps of Engineers

Two portable earth augers have been developed for digging holes to considerable depth at rapid rates by the H. B. Williams Manufacturing Co., of Dallas, Texas.

Currently undergoing tests at the Corps of Engineers' Research and Development Laboratories in Fort Belvoir, Va., the larger of the units weighs 50,000 lb and is powered by a 192 hp gasoline engine. It is capable of digging holes up to 9 ft in dia and 75 ft deep, in many types of earth strata.

The smaller unit, 34 ft, 24,448 lb utilizes smaller versions of the same components, and can dig holes up to 6 ft in dia and 22 ft deep. Truck-mounted, it is highly mobile.

(F&O continued on page 104)

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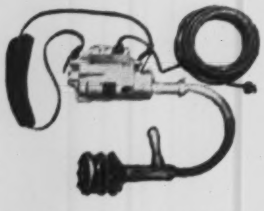
CONCRETE SURFACER
MODEL A



"Berg" equipment is used extensively for surfacing and finishing applications on concrete construction.

The many "BERG" Models available, permit exact selection for your particular application.

The distinctive "BERG" features give you the kind of results that are realized in better quality work, combined with lower costs.

"BERG" Heads and Attachments are interchangeable, thereby providing adpatability for vibrating, wire brushing, sanding and polishing applications.

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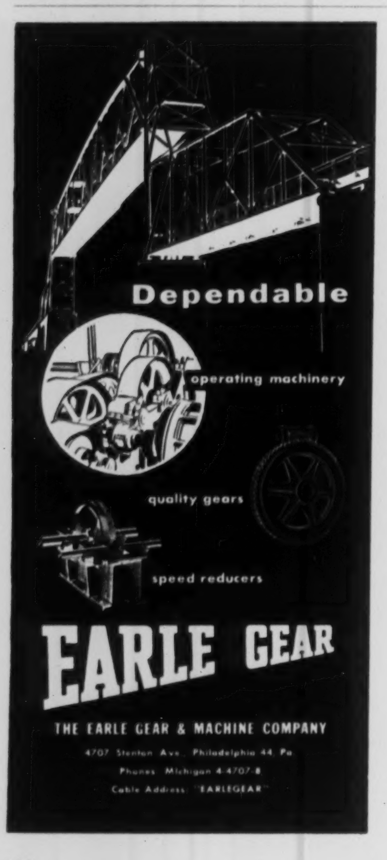

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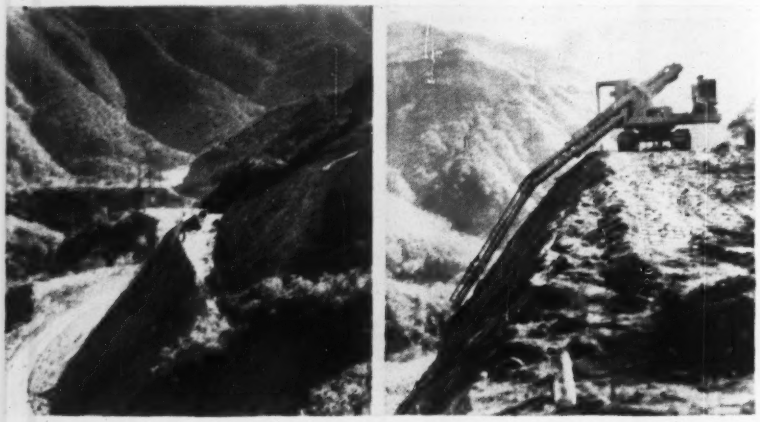
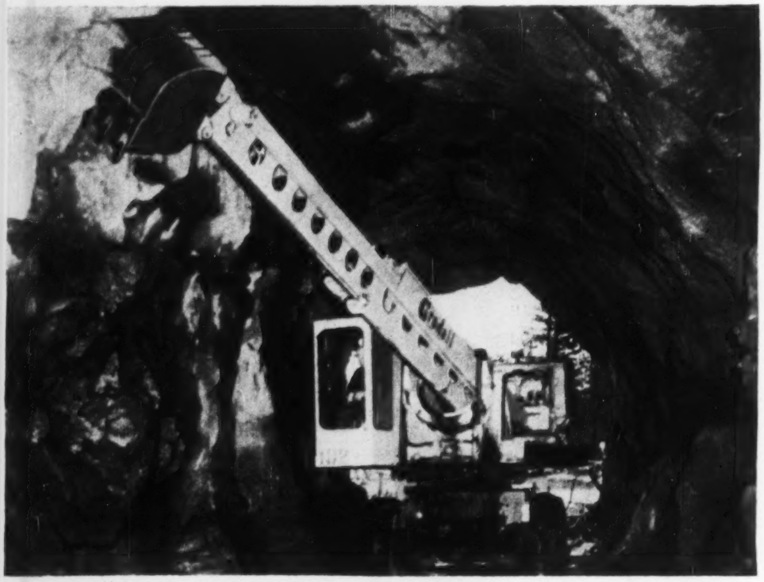


Trouble Spot on a Canyon Road Site

Topanga Canyon Blvd.—a California highway project located at the west end of San Fernando Valley—turned up some tall problems in a short stretch of six-tenths of a mile. Within a couple of hundred feet the job changed from a fill of 100 feet to a cut of 160 feet. And at one point the contractors used a Gradall in a spot where it almost had to stand on its head to move the earth. The machine needed an 18-ft extension boom to provide the necessary reach and a ripper tooth to remove rocks from the slope. Lowe & Watson of San Bernardino, Calif., is the contractor. The Gradall work was subcontracted to Ed Waters, Van Nuys, Calif.



Gradall Takes On Underground Job

That versatile digging machine, the Gradall, has been sent into a 13-ft tunnel to do rock scaling at Beardsley Dam in Northern California. Tunneling through solid granite for diversion of the stream, Project Manager H. O. Tucker ordered the mechanical rock-scaling operation before beginning concrete lining. The project, on the Middle Fork of the Stanilaus River, is a unit of the $52 million Tri-Dam project of Oakdale and South San Joaquin Irrigation Districts. Morrison-Knudsen is sponsor of a joint venture building Beardsley Dam.

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Economical!
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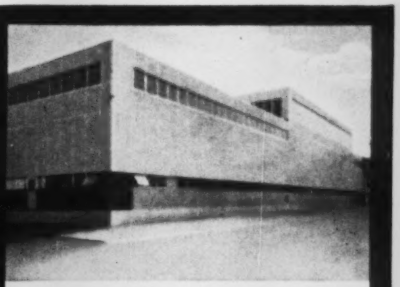
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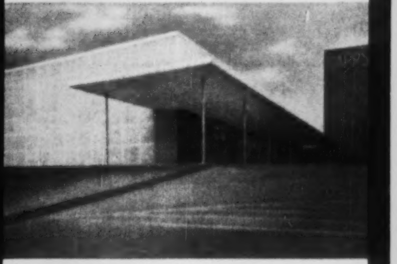
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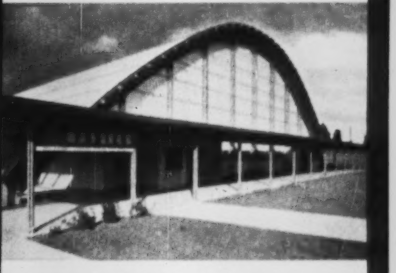
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QUICKLY-ERECTED CURTAIN WALLS FOR ALL TYPES OF BUILDINGS

Do 3 Jobs in 1! Cemesto Panels provide a *structural wall* . . . thermal *insulation* . . . maintenance-free incombustible *finished surfaces* inside and out. Save on heating and air conditioning costs. They blend harmoniously with brick, stone, wood, glass, and metals. May be worked with ordinary tools on the job, or pre-cut to required special sizes at the mill for faster application. Panels fasten to steel framing with metal accessories, or to wood framing with nails or screws.

Attractive Extruded Aluminum Accessories harmonize with gray Cemesto Panel surfaces to lend beauty to curtain walls. Built-in Neoprene gaskets assure weather tightness.

Architects specify this remarkable all-purpose building material for *curtain walls, roof decks,* and *movable interior partitions.* Write today for New File 5500 . . . 52-page simplified data book on design and application details of Cemesto Structural Insulating Panels. The Celotex Corporation, Dept. ENR-66, 120 S. LaSalle St., Chicago 3, Ill.

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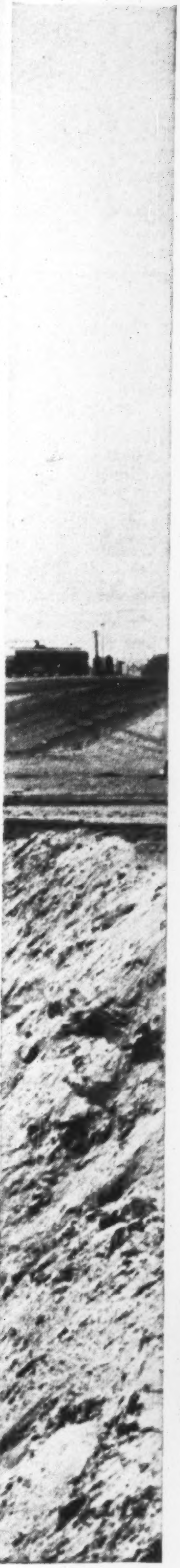
***Cemesto Panels** are strong, rigid, permanent structural insulating units. Their core is Celotex cane fiber insulation board effectively protected against dry rot and termite attack by the exclusive Ferox® Process. Non-combustible cement-asbestos facings are bonded to both sides of this insulating core by a moisture-proof adhesive. Cemesto Panels resist fire, weather, and wear, need no painting or maintenance.

A TEAM OF 46 GMC's HAULING SEMI-TRAILER DUMPS are hustling "fill" for this multimillion-ton job. GMC's new Blue Chip heavy-duty line is engineered to meet *any* requirement up to 63,000 GVW-90,000 GCW. Model W630's are rated at 65,000 GCW and with 34,000-lb. tandem axles.



"We've delivered 3 million tons of 'fill' to keep a sinking island afloat!"

Here's Asbury Transportation's story on their giant Terminal Island, California, job—and the part played by their 46 GMC trucks.

Terminal Island – Long Beach, California, harbor and site of rich-producing oil wells – has been sinking into the sea at the rate of two and a half feet a year.

Naturally, there's hot competition for the huge job of supplying "fill" to keep this island gold mine "afloat." Asbury Transportation willingly shaded their bid very close to land the contract for supplying three million tons in the past three years. After all, there's an estimated 12 million tons still needed over the next decade.

Forty-four new GMC tandems and 2 four-wheelers were assigned to the job. "We had to be sure of completely dependable equipment to take on one like this," owner Al Eyraud declares.

"Even a few delays and a large part of the profits go out the window."

Actually, the GMC's have done better than expected. Maintenance costs over the three years of hard service have been remarkably low. Rear-end troubles – common in this kind of on-and-off-the-road work – have been nonexistent.

And gas mileage – despite "green" drivers and much hauling through Los Angeles traffic – has been a remarkable 4 miles per gallon.

Yet there's nothing remarkable about Asbury's experience with GMC's. You'll find them – gasoline or Diesel – saving time and cutting costs on many of America's biggest construction jobs. *And many of them have the smallest price tags of any truck in their weight class.*

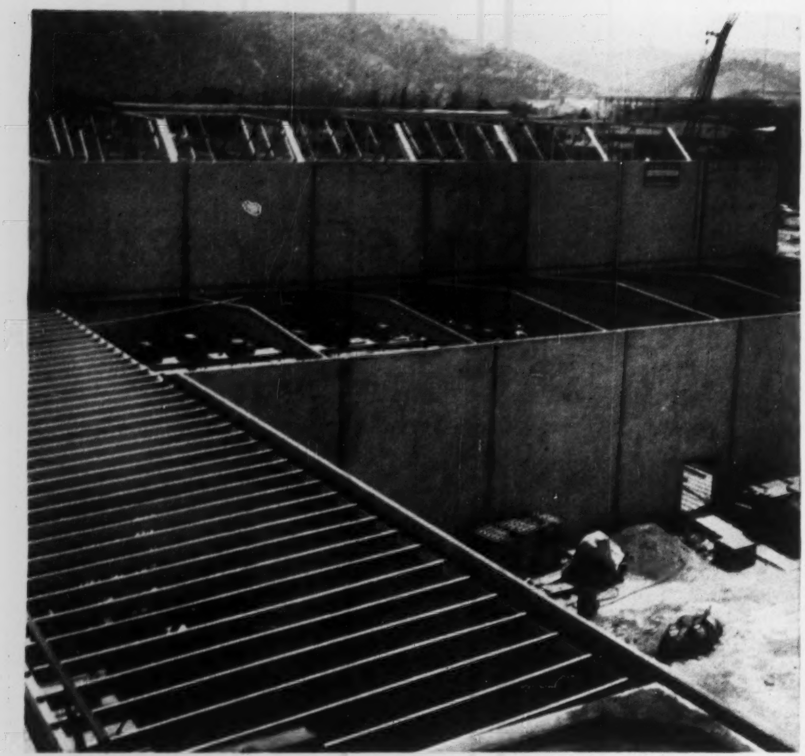
Come see for yourself – at your GMC dealer's!

GMC TRUCK & COACH – *A General Motors Division*

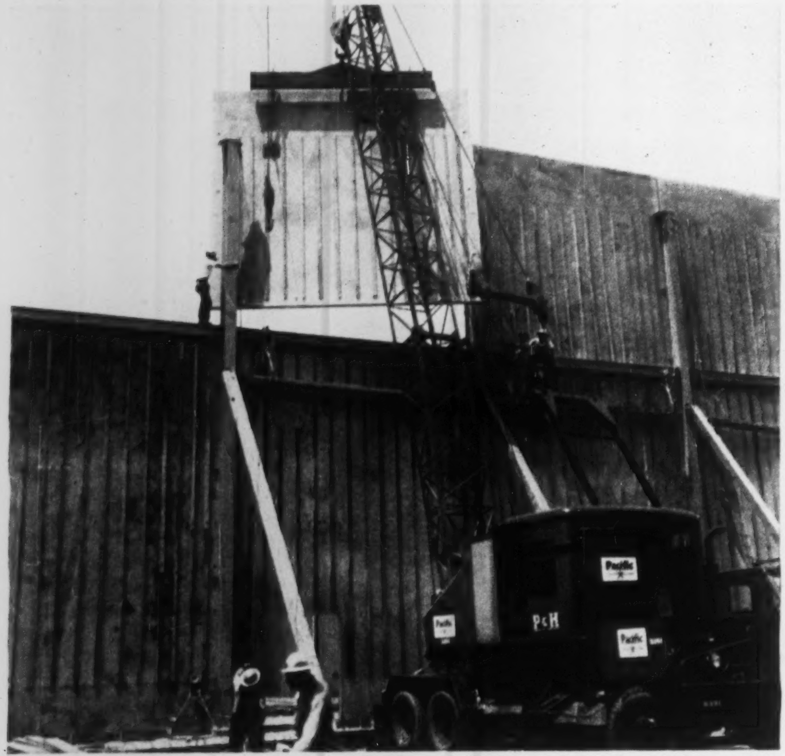
LOADED, WEIGHED AND OUT OF THE PIT IN 3 MINUTES, these GMC's get their crackling pace from GMC's 225-h.p. "503" engine. That's from GMC's great new Blue Chip line of gasoline and Diesel power plants. They team with Safety Power Steering* to ease even the toughest off-the-road work.

WORKING A JOB THAT CALLS FOR 3 MILLION TONS of "fill" in three years, Asbury Transportation's 46 GMC's have chalked up remarkably low operating cost records. And that's typical of GMC owners' experiences – on jobs large and small – the country over!

**Optional at extra cost*



UNITS CONSISTED OF 90 x 140 FT. studio with 46 ft. high walls, and 50 x 140 ft. technical building, 32 x 140 ft. dressing room and service corridor with 27 ft. high walls. Austin Co., designers and builders. Western Construction News Photos.



20 x 19 FT. UPPER TIER PANELS were erected with 2 pick-up points. On the 20 x 27 ft. lower panels, four pick-up points, two .20 of length from top and two .45 from top, were used. Temporary shores were used until roof trusses were installed. Note nailing strips for acoustical materials, pinned to wall panels before tilt-up.

35,000 sq. ft. of walls tilted up in 4 days

THE AUSTIN COMPANY required only 5 months from design to finished structure of this 60,000 sq. ft. three-unit television studio for National Broadcasting Co. at Burbank, Calif. But the fastest part of this fast-moving job was the erection of its 35,000 sq. ft. of walls in 4 days.

This was done by precasting the walls near their intended positions, in 84 concrete panels 20 x 27 and 20 x 19 ft. in area and of 6 in. thickness. After 28-day curing to required 3000 psi strength, the panels were easily tilted up by mobile crane at the rate of more than 20 per day.

Efficient modern construction like this is facilitated by the use of ready mixed concrete, properly processed and poured in place by truck mixers of certified design, capacity, mixing speed and accuracy of water control.

4 1/2 CUBIC YARD MIXER
5 CUBIC YARDS
6 CUBIC YARD AGITATOR

You have a right to insist on this Rating Plate. It certifies compliance with the high industry standards maintained for your protection by the Truck Mixer Manufacturers Bureau.

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Mattoon, Ill.

CHAIN BELT COMPANY
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CHALLENGE MANUFACTURING CO.
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CONCRETE TRANSPORT MIXER CO.
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THE JAEGER MACHINE COMPANY
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WILLARD CONCRETE MACHINERY CO. LTD.
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Legal

Sub Excused For Delay If General Not Liable

If delayed performance by a prime contractor and a sub stem from the same cause and the prime contractor's delay is excused, the sub must also be released from liability.

Here's an example: A sub sued the prime contractor and its surety to recover a balance unpaid for the furnishing of hoisting machinery needed for the job. The prime contractor counterclaimed for damages sustained because of delay in furnishing and delivering the machinery.

The United States District Court for the Northern District of Texas, where the case was tried, denied relief to either party.

The subcontractor appealed to the United States Court of Appeals, which ruled that where the government, for which the work was done, prevented timely performance by its priority laws and regulations and by delays of its engineer in the approval of plans and material and absolved the prime contractor from responsibility for such delays, the prime contractor would not be permitted to hold the subcontractor liable for delays which were also caused by the government.[1]

The court stated: "The government, for which the work was done, prevented timely performance by its priority laws and regulations and by the delays of its engineers in the approval of plans and material. Justly, it absolved its prime contractor, Texas, from responsibility for such delays. It is not just or right now to permit Texas to charge its subcontractor, Caldwell, with damages that were caused by the Government."

As a result, judgment was granted the subcontractor for the balance remaining unpaid to it.

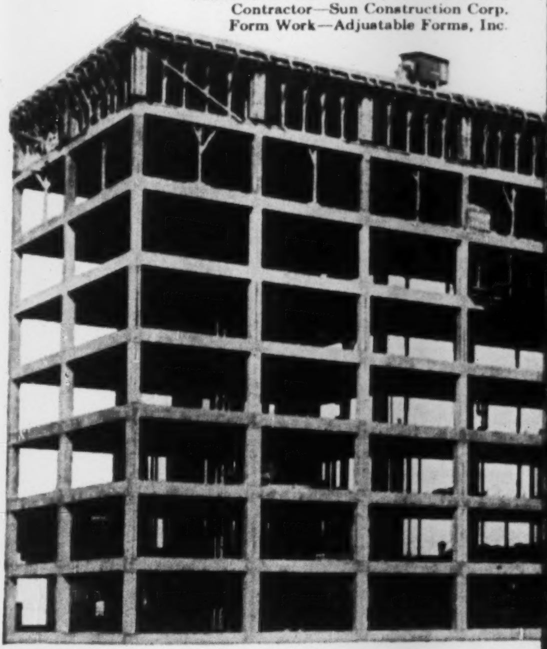
(1) United States, etc., v. Texas Construction Co., et al., 224 F. 2d 289, U.S. Court of Appeals, Aug. 16, 1955.

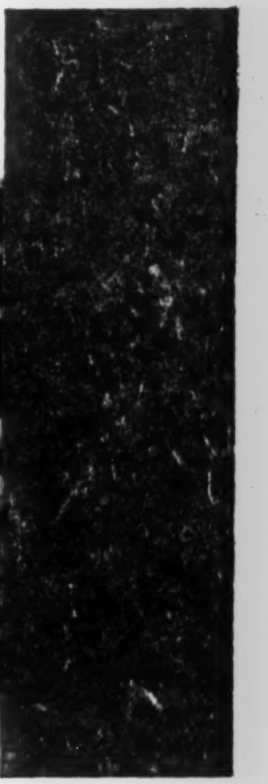
Stranger to a Contract Not Liable for Delays

Two conditions must exist before a person can be held liable for interfering with performance of a contract: (1) knowledge of the existence of the contract, and (2) intentional interference.

A contractor ran up against this problem during construction of the Davis Dam on the Colorado River. This is what happened:

In April, 1946, General Electric Co. entered into a contract with the United States Bureau of Reclamation





Flag House Courts, Housing Authority of Baltimore, Md. Architect—Alexander S. Cochran Assoc. Architect—Wrenn, Lewis & Jencks Contractor—Sun Construction Corp. Form Work—Adjustable Forms, Inc.

Because it leaves a smooth surface...

MASONITE *Concrete Form* PRESDWOOD

Cuts rubbing time to the minimum

When the forms are stripped, concrete poured against Masonite Concrete Form Presdwood® is ready to paint. On Flag House Courts, Baltimore, Maryland, 415,000 sq. ft. of exposed ceilings of floor slabs were quickly made ready for a smooth, long-lasting paint job. Hand rubbing was cut to the minimum.

These dense, grainless panels can be used again and again. Less money is tied up in form costs. They are easy to cut and fit with ordinary carpentry tools. They can even be bent to form arches. In 4' widths and lengths to 12', they're easy to handle. Send the coupon for a free sample.

You Can Cut Costs 3 Ways!

1. Screen side to concrete—for unpainted surfaces. Tiny projections left in concrete cut hand-rubbing costs up to 50%.
2. Screen side to concrete—for painted surfaces. The textured surface left in concrete forms an excellent bond for paint. Only minimum rubbing required.
3. Smooth side to concrete—for painted or unpainted surfaces. Rubbing virtually eliminated. No knots, grain or blemishes in Masonite Presdwood to mar the finished concrete surfaces.

SEND FOR FREE SAMPLE!

MASONITE PRESDWOOD PRODUCTS

MASONITE® CORPORATION
Dept. ENR-67, Box 777, Chicago 90, Ill.

Please send me a sample of Concrete Form Presdwood and your free booklet on cutting costs three ways.

Name ....
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Address ....
City .... *State* ....
Zone ...... *County* ....

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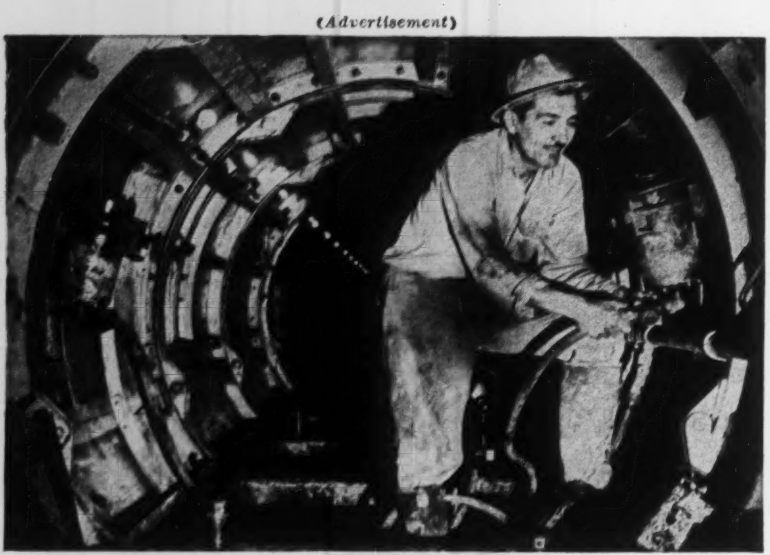


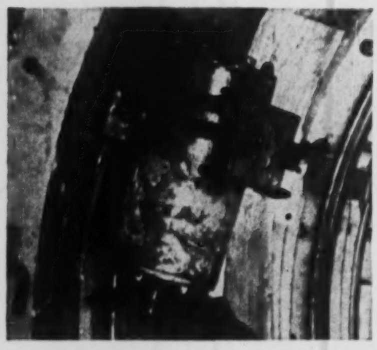
WORKER OPERATES one of the two Viber external form vibrators used on 2.9 mile sewer tunnel job. Vibrators are clamped to form and moved forward as concrete slope advances.

Two Movable External Vibrators Consolidate Concrete in La Cienega And San Fernando Relief Sewer

• **Major problem** of congested sewers in Los Angeles' heavily populated San Fernando Valley is being alleviated by a 2.9 mile long sewer tunnel bored through the Hollywood Hills.

The La Cienega and San Fernando relief sewer tunnel was holed through in horseshoe shape with a minimum diameter of 7 ft. 9 in. During lining, it was made circular with a 6 ft. diameter. Kemper Construction Company, Los Angeles, headed lining operations.

The Kemper crew prepared approximately 135 cu. yd. of concrete daily at a batch plant at the tunnel's entrance and hauled it by 24-gauge train to work site.



VIBER MODEL PX high speed pneumatic vibrator shown mounted on form in sewer tunnel. Model PX is used widely in tunnel lining operations.

Once concrete was discharged on top of T-Lock lining forms and flow commenced around full-circle forms, two external Viber Model PX high speed pneumatic vibrators were used to consolidate it rapidly and completely. Vibrators were clamped to the form and moved forward as concrete slope advanced. A Viber internal vibrator was sometimes used in conjunction with the external vibrators.

Highly experienced in tunnel lining, Kemper Construction Company designed the vibrator mounting clamp to fit the needs of this job. Clamp hangs from angle rail which extends length of form section. As slope advances, clamp may be released to switch vibrator to new position along rail without lifting it from rail.

Viber Model PX vibrators are used widely in tunnel lining operations. They are also used effectively in manufacturing concrete pipe and other precast members wherever reusable steel forms are set up on a production basis.

For further information on Viber's complete line of internal and external vibrators, contact your authorized distributor or Viber Company, Dept. 7-B, 726 South Flower Street, Burbank, Calif.

VIBER

CONCRETE VIBRATORS SINCE 1931

to manufacture and supply certain electrical generators to be used in connection with the construction of the Davis Dam. The various units covered by the contract were delivered to Kingman, Arizona, between October 1948 and February 1949.

In September, 1949, the Bureau entered into a contract with Donovan Construction Co. to install the generators that has been supplied by General Electric Co. Apparently the generators had been defectively constructed with the result that it became necessary to disassemble the generator equipment several times before it would operate properly. In fact, some parts of the equipment had to be sent back to the manufacturer's plant in order that the necessary repairs could be made.

As a result of the defects, the performance of the installation contract was delayed, resulting in increased cost of performing the work by the installation contractor.

The contractor brought an action against General Electric to recover the damages sustained, claiming that the defects in the equipment resulted from negligence on the part of the manufacturer. The action was dismissed, the court holding[1] that there was no privity of contract between the manufacturer of the equipment and the contractor who installed it.

The court stated: "There are a multitude of cases which sustain the principle that, as an indispensable condition precedent to liability for interference with the performance of one's contract, there not only must be knowledge of the contract, but there must be an intentional interference therewith." The court also pointed out that the contract to install the equipment was not entered into until after the equipment had been delivered, so that there could not have been any intent on the part of the manufacturer to interfere with the performance of the installation contract.

[Editor's Note: Werbin suggests that if the installation contractor had brought an action against the government for delays caused by the failure on the part of the government to provide proper equipment to be installed, the government would have counterclaimed against the manufacturer and some settlement of the matter might have resulted.]

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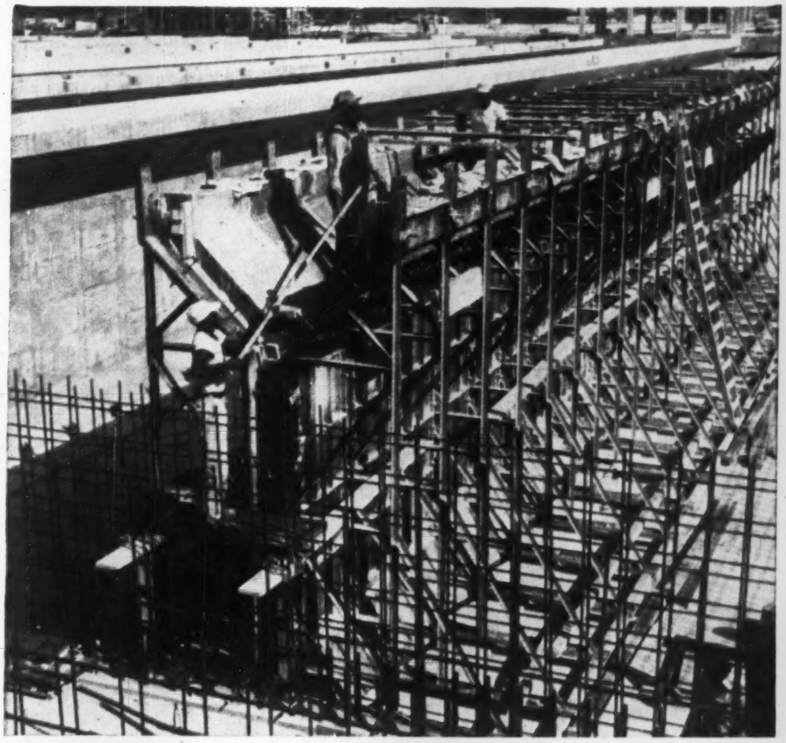
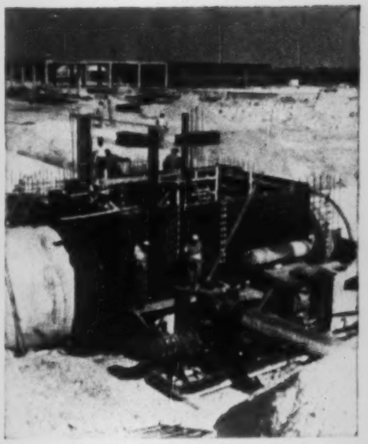
(1) Donovan Construction Co. v. General Electric Co., 133 F. Supp. 870, U.S. District Court, August 5, 1955.

(These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.)

(Advertisement)



Special Y wall forming system makes for simplified stripping operation. 100% reusability of all materials. Note complete absence of lumber normally required for shoring and bracing on this type of structure.



Intricate forming in restricted areas presented no problem. Uni-Form Panels erected aligned and braced one side eliminated difficulties normally encountered in placement of reinforcing steel. Note Uni-Form Panels around large precast pipe.

CUTS MATERIAL COSTS with

Pre-Fab Form System on Sewage Plant Job

In the construction of the Miami Sewage Treatment Plant Job the Paul Smith Construction Co., of Miami, Florida chose to use the Uni-Form Panel System in the forming of one million sq. ft. of contact area. The contractor estimated that the use of the Uni-Form System *saved 40 percent in material costs alone.* In addition, faster form erection with fewer men kept the job moving ahead of schedule and reduced estimated labor costs considerably. These fine results were obtained even though this was the contractor's first experience with the Uni-Form Panel System.

This considerable savings in material and labor was realized in spite of intricate Y wall forming and pipe intersections which causes complicated forming problems with conventional forming systems.

Pre-fabricated, ready to use—completely engineered to handle most forming problems, the Uni-Form Panel System provides such advantages as simple assembly—minimum one side alignment and bracing—automatically accurate wall widths—positive internal spreading—faster stripping and maximum re-usage to give the contractor lowest all around form costs.

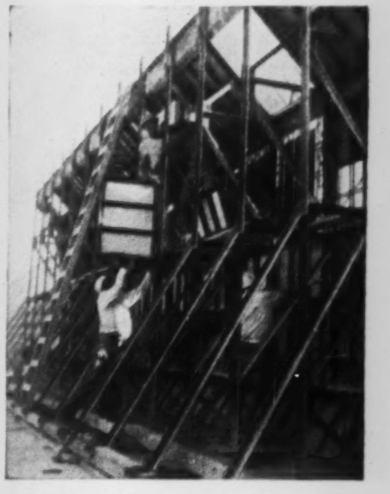
Y wall trusses designed to member with standard Uni-Form Panels formed a completely automatic system for handling the special forming problems, and were big factors in the economy and speed obtained on the job. Simple assembly of Standard Uni-Form Panels on the trusses eliminated many of the aligning, bracing and spreading problems usually encountered in Y wall construction. In addition to simplified forming the combination system of standard Uni-Form Panels and trusses eliminated many of the problems normally encountered in the stripping of a wall section of this type. The contractor was well pleased with all phases of his forming and stripping operations.

Why not investigate the many advantages the Uni-Form Panel System can bring to you? Write for the Uni-Form Catalog — or better yet, send us a set of plans for an estimate on your next job. Let us prove to you as we did to the Paul Smith Construction Co., that the Uni-Form Panel System can cut your forming costs.

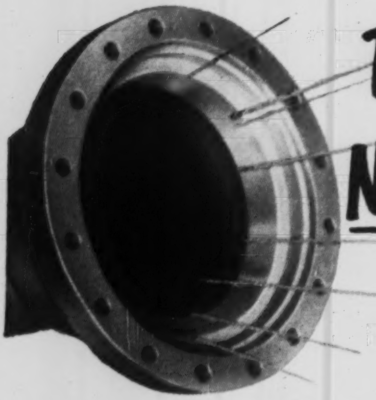
UNIVERSAL FORM CLAMP CO.
1238 N. Kostner Avenue • Chicago 51, Illinois

Branch Offices and Warehouses:
Los Angeles • San Leandro, Calif. • Houston, Texas
Cleveland, Ohio • Baltimore, Md. • Atlanta, Ga.

One side aligning and bracing provides clear unobstructed working areas increasing job efficiency.



Y wall trusses incorporated alignment, bracing, shoring and scaffolding requirements.

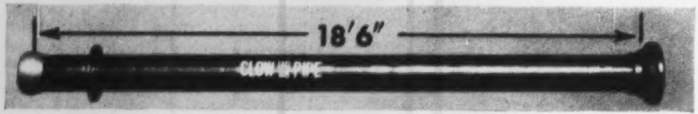


RIVERS? Nothing to 'em!

with

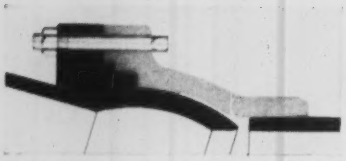
CLOW CAST IRON
Ball-and-Socket
RIVER-CROSSING PIPE

Faster, Simpler Installation



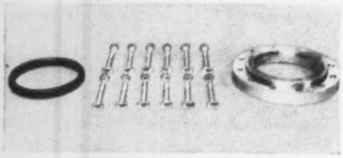
Longer laying lengths, fewer joints. Shorter lengths to exact dimension.

Full Flow at Full Deflection

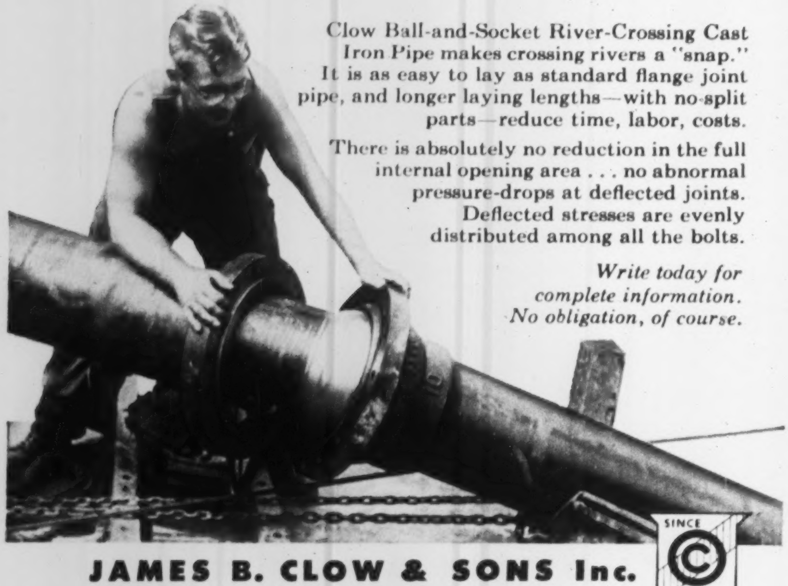


Full 15° turning deflection.
No restriction of the waterway.

Fewer Parts No Split Parts



Needs only a ratchet wrench for fast, firm assembly.



Clow Ball-and-Socket River-Crossing Cast Iron Pipe makes crossing rivers a "snap." It is as easy to lay as standard flange joint pipe, and longer laying lengths—with no-split parts—reduce time, labor, costs.

There is absolutely no reduction in the full internal opening area . . . no abnormal pressure-drops at deflected joints. Deflected stresses are evenly distributed among all the bolts.

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Obituaries

DeForest H. Dixon, 82, co-founder in 1902 of the Turner Construction Co., New York City, died May 5 in Great Neck, N. Y. From 1902 to 1949, he was a director of the company, serving also as vice president from 1910 until he retired from active service in 1930.

After graduating from Cornell University in 1896 with a civil engineering degree, Mr. Dixon joined the city engineer's office in his native Milwaukee. During the Spanish-American War, he served with the army engineers. After that war, he worked on concrete dam and waterworks projects in New York and Pennsylvania. In 1901, he was the engineer on the rock tunnel section of the subway under New York's Fourth Ave.

Ernst E. Pfeiffer, 73, chief engineer of the Uris Brothers office-building contracting firm, New York, N. Y., died May 14. Coming to the U. S. from Germany in 1911, Mr. Pfeiffer held civil engineering posts in Los Angeles, Washington and New London, Conn. He joined Uris Brothers more than fifteen years ago and participated in defense housing construction during World War II. Later, he was engaged in a number of building projects on Madison, Park and Lexington Ave. in New York.

Clarence Wilson Brazer, 76, former president of the National Council of Architectural Registration Boards, died May 6 in Flushing, N. Y. Head of the NCARB from 1929 to 1931, Mr. Brazer also served from 1919 to 1937 as a member of the Pennsylvania Board of Examiners of Architects. Among other architectural works, he designed the capitol in San Juan, P. R.

Clifford Lewis Jr., 85, former commissioner of Public Works in Utica, N. Y., died May 9 in Philadelphia. Lewis, a civil engineering graduate of the University of Pennsylvania and a specialist in water supply, structural and municipal work, set up his own engineering firm in Utica in 1902. He designed and built bridges, water-pipe lines and established miles of transmission power lines in the Mohawk Valley for public utilities. He also served as County Engineer of Oneida, N. Y.

Burton Marye Jr., 57, who had been the first general manager of the Richmond-Petersburg Turnpike Authority, died May 8 at Bon Air, Va. Before

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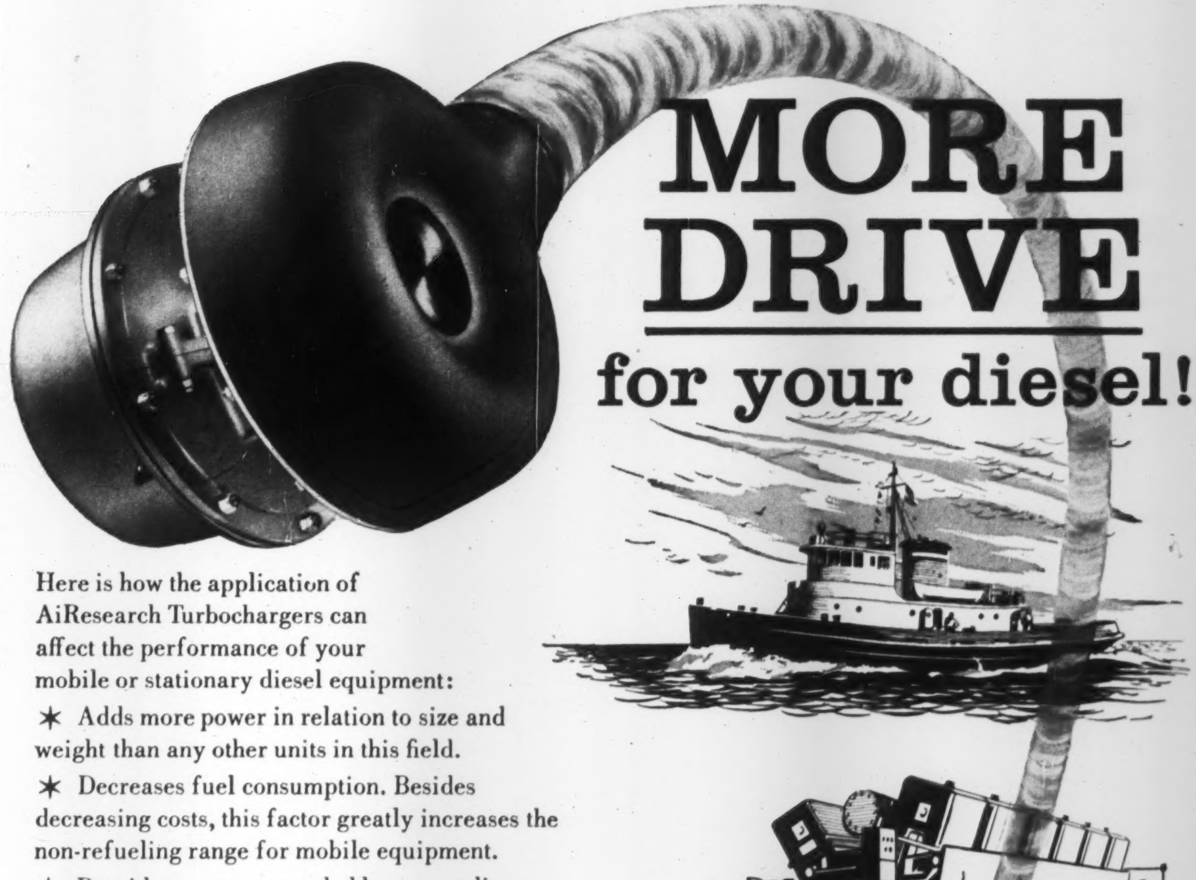

Here is how the application of AiResearch Turbochargers can affect the performance of your mobile or stationary diesel equipment:

✶ Adds more power in relation to size and weight than any other units in this field.

✶ Decreases fuel consumption. Besides decreasing costs, this factor greatly increases the non-refueling range for mobile equipment.

✶ Provides power as needed by responding rapidly to acceleration requirements. This factor greatly decreases smoking.

✶ Maintains sea-level power under all altitude conditions.

✶ Greatly reduces the noise level of your equipment while eliminating power-wasting mufflers.

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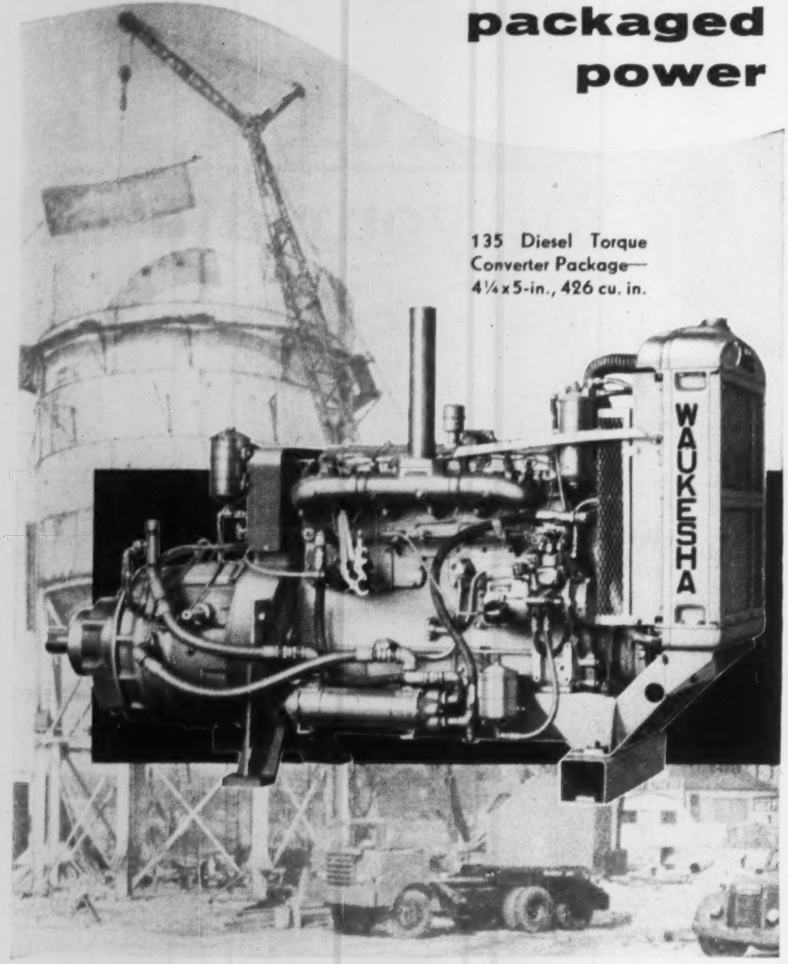

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for torque converter application in shovels, cranes and hoists; trucks and tractors—the result of Waukesha's 15-year development program in this field. Torque converters eliminate shock to driving and driven mechanism; prolong life of equipment; boost output work 10 to 40%. Power, automatically matched to the load, is delivered smoothly without stalling.

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50th ANNIVERSARY Waukesha MOTOR 1906-1956

317

joining the turnpike authority last July, Mr. Marye had been with Virginia's Department of Highways since 1930. In mid-1955, after many years of advocating superhighways as a solution to some of Virginia's traffic problems, he was appointed general manager of the $69-million, 35-mi Richmond-Petersburg Turnpike.

Melvin L. Enger, 75, who retired as dean of the University of Illinois College of Engineering in 1949, died May 13 in Escondido, Cal. He was a member of the staff for 42 years and had been Dean of Engineering from 1934 until his retirement.

John J. Caton, former dean of the engineering school of the University of Detroit died May 16 at Phillipsburg, N. J. He founded the Chrysler Institute of Engineering at Detroit in 1929, as the only industry-sponsored school in the nation to give accredited degrees in engineering. A native of Easton, Pa., he was a member of Philadelphia's Franklin Institute and the Royal Society of Engineers, of England.

Ray Warren, 59, former city engineer at Greensboro, N. C., and for the last 10 years director of the Federal Housing Administration for the City of Greensboro died May 16. A native of Washington, N. C., he served as a lieutenant colonel during World War II, and was a member of the ASCE.

Chester B. Lewis, 71, retired Cincinnati engineer, died May 18. Born in Madison, Ind., he received his engineering degree cum laude from Harvard in 1907. Mr. Lewis worked as civil engineer in New York City during the construction of the Pennsylvania Tunnel and later was supervising architectural engineer with the Albert Kahn firm in Detroit.

Joe W. Holman, 41, president of Marr & Holman Architects and Engineers Inc., Nashville, Tenn., died May 20. President of the firm since the death of his father 2½ years ago, he had participated in the construction of baseball stadiums in Miami and Clearwater, Fla., and a new federal building in Nashville.

William G. Bradstock, 43, labor relations adviser of the Ohio Contractors Association and former personnel manager for Dresser Ideco Co. of Columbus and Rockwell Mfg. and Tracy Mfg. Co. of Pittsburgh, died May 21 in Columbus, Ohio.

Field joints with Beth-Cu-Loy only a matter of minutes

Bolts, a band of Beth-Cu-Loy, and a hand wrench are all you need to make a tight culvert joint right in the field.

Compare this with the man-hours needed to assemble an equivalent culvert of any other material!

Ease of assembly is only one of many reasons for the growing use of drainage pipe made of Beth-Cu-Loy galvanized sheet. The strength of steel permits the use of relatively light-weight material, so that handling is simpler and costs less. Long lengths are feasible, too, reducing the number of joints and speeding up installation of the pipeline.

Trenching can be less finicky because Beth-Cu-Loy pipe is flexible regardless of diameter, easily conforms to grade and alignment. Further, it flexes with the fill to equalize loads around it, and absorbs vibration, impact and shifting actions due to weather.

The copper in Beth-Cu-Loy sheets, along with the heavy zinc coating, provides a double defense against corrosion. Pipe and culvert fabricated from this steel give long and trouble-free service. Bethlehem manufactures the Beth-Cu-Loy galvanized corrugated and flat sheet stock used by pipe fabricators. If you would like to have more information about Beth-Cu-Loy or the names of those who can supply pipe made from it, just call our nearest sales office.

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STRIP ACT AT ONLY 1200 RPM: To join new and old bridge structures on the $8,527,000 Spring-Sandusky Interchange, at Columbus, Ohio, required demolition of the existing deck. Seven air tools (3 medium sinkers, 3 heavy duty breakers and a heavy chipping hammer) were supplied by a Jaeger "600" Rotary which never ran faster than 1200 rpm. Visintine & Company, contractors.

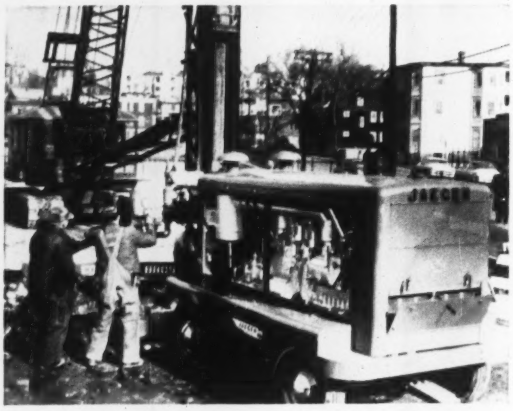
IDLING AT ONLY 900 RPM, on this road job, the Jaeger "600" Rotary is operating these four Thor "75" rock drills at 100 lbs. pressure. Under all ordinary conditions the same compressor will hold full pressure in two heavy duty wagon drills while operating well below its full load speed of 1650 rpm. "It's a windjamming sonofagun" says John Newman, Orco Construction president, Kirkwood, Mo.

Why air costs you less with a Jaeger Roto®

Full load speed of other "600" rotary compressors is as high as 1800 rpm. Full load speed of the Jaeger Rotary is 1650 rpm, using the same economical GM 6-71 diesel engine. This difference means that, for the lengthened life of your compressor, you will produce air with less fuel, with fewer feet of engine piston travel and up to 150 fewer compressor revolutions per minute.

Further improvement in efficiency results from Jaeger's closer regulation of engine and compressor to air demands. Speed modulation over the entire range is smooth and stepless, and so instantaneous as to prevent any over-run and racing of engine.

Jaeger "125" and "365" Roto Air Plus units offer comparably superior performance. For complete details, see your Jaeger distributor or send for Catalog JCR-5.



SMOOTH AS STEAM, AT A FUEL-SAVING 1200 RPM: A Jaeger "600" Rotary and Vulcan #1 hammer teamed up to drive 14", 80# H-beam piling to approximate 100' depth on Massachusetts' Northeast Expressway, at Chelsa. Never running faster than a fuel-saving, compressor-saving 1200 rpm, the compressor maintained a hammer speed of 60 blows per minute with average penetration of 1" per blow. Coleman Brothers, Corp., contractors.

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Men and Jobs

With July 1 set as commencement date . . .

Maryland Port Authority Is Staffed

Robert W. Williams, Baltimore admiralty lawyer and former member of the Federal Maritime Board, has been appointed chairman of the young Maryland Port Authority.

Other members selected this week by Gov. Theodore R. McKeldin were:

D. Luke Hopkins, chairman of the finance committee of the Fidelity-Baltimore National Bank, former member of the Atomic Energy Commission Security Panel.

Avery W. Hall, former member of the Maryland State Roads Commission, and a trucking and insurance executive.

R. Paul Smith, president of the Potomac Edison Company, of Hagerstown, Md., and the Union Manufacturing Company.

A fifth member of the port authority board will be selected by Governor McKeldin after Anne Arundel County submits to him a list of five nominees.

Williams was one of five nominees submitted to McKeldin by Mayor Thomas D'Alesandro, Jr., to represent the city of Baltimore. Hopkins was one of Baltimore County's nominees, and Hall and Smith were at-large members selected solely by McKeldin.

The new State Port Authority was created by the Maryland General Assembly earlier this year as a move to meet the threat of increased competition from ports on the Eastern seaboard and the St. Lawrence Seaway.

The authority, which will go into operation July 1, has powers to float bonds, condemn land for port expansion subject to local governmental approval, and promote business for the port of Baltimore at home and abroad.

To finance the authority's operations, the Maryland corporation income tax was boosted this year from 4½ to 5%.

A. C. Kirkwood

Heads NSPE Functional Group

A. C. Kirkwood of A. C. Kirkwood Associates, Kansas City, Mo., was elected chairman of the first formally organized functional section of the National Society of Professional Engineers at its annual meeting in Atlantic City (ENR May 31, p. 26). The functional section is formed and will be developed under Kirkwood's chairmanship for the participation of consulting engineers in private practice and the NSPE members in their employ.

Robert H. Lyddan Appointed Assistant Director of USGS

Robert H. Lyddan has been appointed as assistant director of the U. S. Geological Survey. He had been regional engineer at the Atlantic regional office in Arlington, Va., since July 1955. Before that he was chief of the division's plans and coordination branch.

A 1931 graduate of the University of Kentucky, he joined the Geological Survey in 1933. He has served as chairman of the Surveying and Mapping Division of the American Society of Civil Engineers and is a director of the American Congress on Surveying and Mapping.

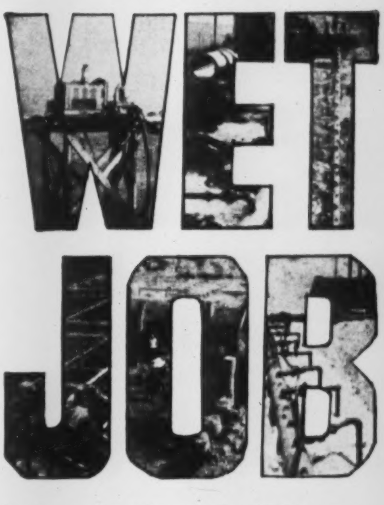
New TAMS Partner Named

Edward K. Bryant, now general manager of the firm's Southeast Asia office at Rangoon, Burma, has been admitted as a partner in the New York consulting engineering firm of Tippetts-Abbett-McCarthy-Stratton.

A graduate of Rensselaer Polytechnic Institute, Mr. Bryant headed his own consulting firm for some years; served in World War II as commander of a Seabee battalion in the Pacific Ocean area; and joined TAMS in 1946, when he served successively as project manager on port surveys of Baltimore, Philadelphia, Trenton, Seattle, and on other engineering projects. For the past two years he has been the firm's chief technical advisor to the Burma government on its seven-year development plan.

(Men and Jobs continued on p. 118)

IF IT'S A



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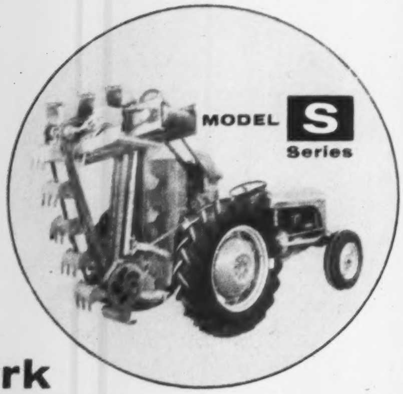
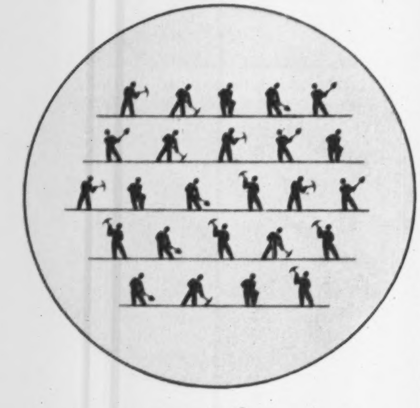


equals the work
of 25 pick and shovel men!



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The Everett Trencher cuts clean straight trenches up to 42" deep, 12" to 18" in width. It operates from the power take-off of the tractor—raised and lowered by built-in hydraulic system. Quickly installed. A "V" belt safety slip feature is built into the drive of the trencher which automatically stops the bucket line and prevents damage when obstructions are encountered.

Note these advantages:

- **NEW built-in Rock Guard**
- **NEW single wheel design gives faster penetration**
- **NEW "V" Power Drive with V Belt Safety drive**
- **NEW easily accessible controls**

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Geological Survey Post Goes to Robert Lyddan

Robert H. Lyddan, a civil engineer engaged in topographic activities for over 25 years, has been named assistant director of the Geological Survey, U.S. Department of the Interior.

Lyddan comes to his new post from the topographic division of the Geological Survey's Atlantic office, where he has been regional engineer since July 1955. A graduate of the University of Kentucky, he joined the agency in 1933, and has since held various assignments in Alaska, Puerto Rico and the United States.

A member of the American Society of Photogrammetry and of the Society of American Military Engineers, Lyddan has served as chairman of ASCE's Surveying and Mapping Division and is now a director of the American Congress on Surveying and Mapping.

G. G. Werner, Jr. Appointed A Vice President of M-C&S

G. G. Werner, Jr., has been named a vice president of the Merrit-Chapman & Scott Corp. He will serve under William Denny, executive vice president of the Construction Department.

Active in the construction field for more than 25 years, Werner recently joined M-C&S after two years as construction manager for the Morrison-Knudsen Co., Inc., on the French Moroccan airbases.

Previously, he had served as construction manager for the U.S. Steel Corp. on the Cerro Bolivar project and in Greece for the Guy F. Atkinson Company.

A civil engineering graduate of Johns Hopkins University, Werner is a member of ASCE, AWWA and The Moles.

George Rogers Executive To Join Maryland Company

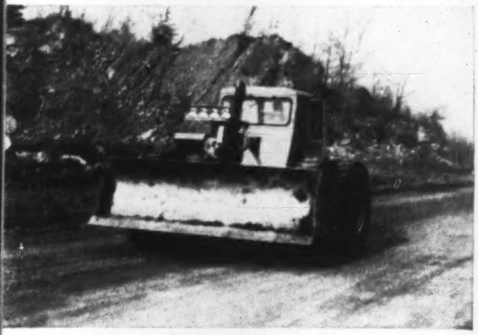
Vladimir N. Nichols will resign in June as vice president and general superintendent of George W. Rogers Construction Corp., New York City, to become general superintendent of construction operations for The Leo Butler Co., College Park, Md.

Nichols, a civil engineer specializing in the heavy construction field, has held the Rogers post for the last 10 years. Earlier in his career he was associated with Bethlehem Steel Corp.

(*Men and Jobs continued on p. 120*)

Speed and Mobility

get more work done!



Tournatractor takes the shortest route to job . . . via highway or cross country . . . cuts hours from job-to-job moves.

208 hp Tournatractor with PCU on rear can be hooked up to pull scrapers, rooters, and rollers.

Rubber tires do not damage rails or ties... unit can switch up to 10 fully-loaded railroad cars at once.

Whenever your application involves scattered job assignments, Tournatractor's 17 mph forward speed and extreme maneuverability cuts moving costs and reduces the non-pay hours of moving time. Big, low-pressure tires let you drive Tournatractor anywhere. For long moves, you save time, bother, and expense of locating a trailer, moving in extra manpower and transport equipment, loading and unloading.

Speed on the job

Tournatractor pulls, dozes, pushes at working speeds 2 to 3 times faster than crawler tractors. You have 3.69 mph in second gear, 8.38 mph in third, compared to crawler speeds of around 2 mph in second, and 3 mph in third. Tournatractor travel speed of 17 mph compares to the crawlers' top ranges of 4 to 6 mph. You change gears instantly . . . waste no time shifting.

8 mph reverse speed

High reverse speeds give a very important time-saving advantage to tractor-on-rubber. Nearly 50% of your working cycle on dozing or pushing jobs is usually spent backing up. Tournatractor's reverse speed cuts crawler backing up time by almost 25 to 50%. Crawler highs in reverse range from 3.1 to 6.2 mph. Tournatractor high in reverse is 8 mph.

Instant shifting

Constant-mesh transmission aids high-speed performance by eliminating delays in changing gears . . . saving vital momentum . . . gives you any gear ratio instantly. Tournatractor works in higher gear ratios because there is no loss of momentum for shifting. Torque converter increases this advantage by giving you wide automatic over-lapping of gear ratios, without depending on operator to jockey levers to get the most effective ratio of power and speed to load.

Ample flotation and traction

2′ wide tires stay on top of soft ground instead of digging in. Lugs bite into underfooting to give traction. Tire pressures as low as 20 lbs. absorb shock. Rolling action compacts loose materials far more effectively than crawlers.

Lower maintenance

There are 4 easy-rolling-wheel-assemblies as compared to more than 500 wearing parts in standard track-assemblies. This means less maintenance. Dollar-wise this reduction in maintenance time can mean a saving of $3 per hour in operating expenses.

Easier to operate

Fingertip electric controls work at the flick of a switch. Steering, raising and lowering the blade, and operating the power-control-unit are all handled by buttons on dashboard. There are no levers, wheels, or other manual controls to handle. Big, low-pressure tires greatly reduce jars and jolts, stress and strain, on both operator and machine.

Interchangeable equipment

Adding to Tournatractor's versatility are a number of interchangeable attachments . . . Bulldozer, Angledozer, Root Rake, Snow Plow. This versatile tractor can also be equipped with a Push-Block, Logging-Winch or Tree-Pusher for additional applications. Drawbar and PCU are available for hauled equipment. Electric-control, open-top scrapers are also available for use with Tournatractors.

Find out for yourself how Tournatractor's go-anywhere mobility and 17 mph speeds can help you get more work done. Compare this rubber-tired tractor alongside your present crawlers. Write or call for a demonstration.

Tournatractor—Trademark Reg. U.S. Pat. Off. T-926-G-b

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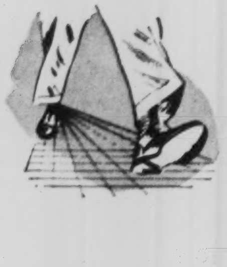

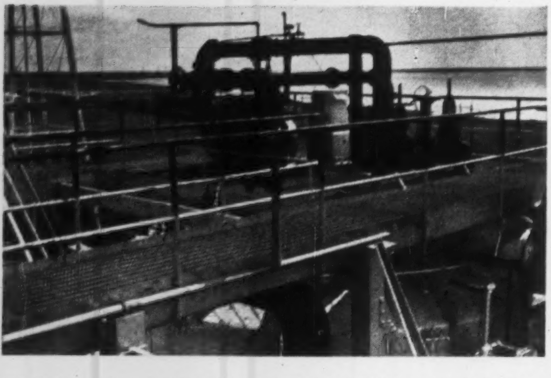

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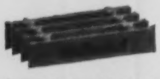
Sturdy, one-piece construction with tops of all bars flush provides open steel flooring and stairs for safe, easier walking. Gary Grating is furnished in a wide variety of neat appearing designs and sizes—and is tailor-made to fit your needs. For complete description and installation pictures on Gary Welded Grating, Stair Treads and Gary-Irving Decking, ask for Catalog E-66



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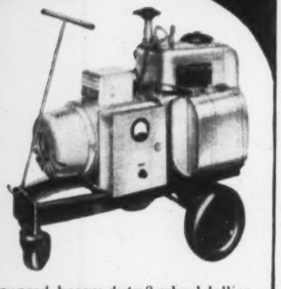
provide a dependable, low cost power source . . . speed up work performance by operating time and labor saving power tools. Wherever the job—whatever the need—you can count on a WINPOWER Electric Plant to meet your requirements.



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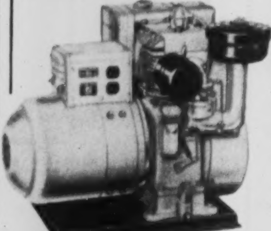

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All Standard Phases and Voltages

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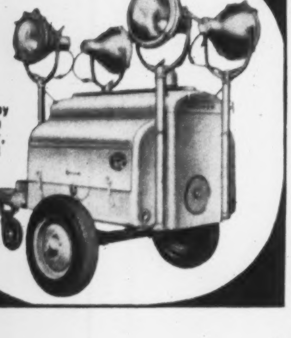
Four 80,000 c.p. flood lights raise to 8⅓ ft.—aim in all directions. Control panel has duplex receptacles for extension light and power tool lines—voltage regulator—circuit breakers—fused circuits.

Tows at highway speeds on heavy-duty trailer with leaf springs—retractable caster wheel. This is the finest, most flexible unit available. 5 KW, 115 or 230 Volt.



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Men and Jobs Briefs . . .

• **Associations** – The National Highways Users Conference elects as chairman **William S. Richardson,** president of the B. F. Goodrich Company . . . **John W. Weber** is appointed as an assistant to the managing director of the American Concrete Pipe Assn. . . . The Asphalt Institute transfers district engineer **Frank H. Gardner** from Albany, N. Y., to Atlanta, Ga.

• **Corps of Engineers**–Acting Deputy Chief of Engineers for Military Operations and Assistant Chief of Engineers for Military Supply **Brig. Gen. William C. Baker, Jr.,** is assigned to Fort Leonard Wood, Mo.

• **Careers**–Consultant for the General Electric Company on water management and waste control, **Kenneth S. Watson** of Schenectady, N. Y., is appointed by the U. S. Secretary of State as engineer advisor to the United States delegation to the Ninth Meeting of the World Health Assembly in Geneva, Switzerland. . . . **Robert L. Sumwalt,** dean of the University of South Carolina, School of Engineering, will become chairman of the South Carolina State Board of Engineering Examiners on July. . . . **George Armstrong** is named engineer in charge of construction in British Columbia for Royalite Oil Co. Ltd., with offices in Vancouver, B. C.

• **Business**–Albert Kahn Associated, architects and engineers, Detroit, Mich., re-elects **George H. Miehls** as president of the firm and names him to the newly-created post as chairman of the board. . . . **A. L. Swanson** and **H. R. Wright** form a consulting engineering firm in Vancouver, B. C., to be known as Swanson, Wright & Co. Engineers Ltd. . . . **M. M. Hawkey** establishes himself in practice in Vancouver, B. C. and offers a co-ordinated consulting and design service.

• **Retirements**–**Norman M. Sutherland,** irrigation expert for the Alberta, Canada, Department of Agriculture, who has served as chief engineer with the Water Resources branch since 1954. . . . **Hugh R. McCall,** sanitary engineer director and chief sanitary engineer of the Public Health Service's Division of Indian Health, after 14 years as a commissioned officer in the Public Health Service. He will be succeeded by **Albert H. Stevenson,** who has just completed an assignment with the Federal Civil Defense Administration in Battle Creek, Mich.

On cleanup work, "D's" loaded rock and excess material from road shoulders and disposed of them in waste areas.

How Union Building & Construction cut cleanup time and cost on Indiana Turnpike

Here's how a contractor of Passaic, N.J., used a D Tournapull to cut costs on his Indiana Turnpike contract. This 28 mph 7½-cubic yard "D" can do the same for you:

Handle cleanup and sub-grading

Typical cleanup work, on a 13.1-mile section of the turnpike, had 3 D Tournapulls self-loading and hauling excess materials from shoulders to nearby waste areas. The "D's" speed and mobility paid off, because cleanup assignments were scattered over many sections of the turnpike.

Sometimes, these handy scrapers hauled rock and excess materials a few hundred feet, sometimes thousands of feet, depending upon how far the cleanup area was located from the fills. After completing cleanup work, the three "D's" hauled gravel subbase and spread it along shoulders and backslopes prior to landscaping. Two other D Tournapulls were profitably used spreading topsoil along shoulders and backslopes. Occasionally, when this work was caught up, they were used for production dirtmoving on cut-and-fill.

When photos were taken on the job, nearly 400,000 sq. yds. of topsoil 2″ deep had been placed. This total was accomplished, using 2 to 5 "D's" as available, and when needed.

"Hard to beat"

According to this contractor, "D's" versatility played an important part on this 3,500,000-yard job. They had also done outstanding work on other assignments, too. For example, recently 2 "D's" placed over 1,000,000 sq. yds. of topsoil 4″ deep, some of it down 4 to 1 slopes, on the Garden State Parkway in New Jersey.

Foreman Wayne Shumaker said, "These Tournapulls do finer work and get around quicker than other small rigs." Operator Ernest J. Janssen added, "'D's' are easy to operate, especially for finishing. In close work, they're hard to beat!"

For speed and mobility on cleanup, and other odd-job assignments, as well as in production hauling, check D Tournapulls today. Call or write your LeTourneau-Westinghouse Distributor for all the facts.

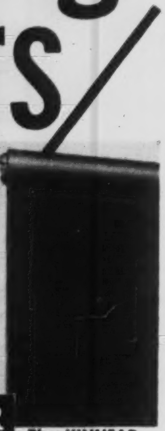
Filling in gravel subbase, "D's" maintained even flow of material along shoulders by spreading on the run.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-935-H-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company



Kinnear Rolling Doors

Kinnear Steel Rolling Doors *introduced the* **single-shaft torsion spring.** *It assures uniform spring action . . . uniform regulation of operating ease from a* **single adjustment wheel.** *Many other special features make Kinnear your best door buy! Send for catalog!*

KINNEAR ROLLING DOORS
Saving Ways in Doorways

The KINNEAR Mfg. Co.

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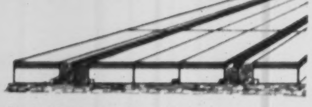

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CROSSING SLABS

- Steel edge armored, steel reinforced slabs.
- Creosoted oak fillers and flangeways.
- Durable, smooth riding, low maintenance.

PERMACRETE PRODUCTS CORPORATION
1839 South Wall Street, Columbus 7, Ohio
Columbus, Ohio Greenville, Ohio Chicago, Illinois

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PNEUMATICALLY PLACED CONCRETE

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420 LEXINGTON AVE., NEW YORK 17, N. Y.
MURRAY HILL 3-7699

Unit Prices

New York Parkway Contract 21.8% Below Estimate

The $2,635,834 contract awarded by the State of New York Department of Public Works for 5.58 miles of the Palisades Interstate Parkway in Rockland County was 21.8% below the engineer's estimate. Included in this bargain price were 4.25 miles grading and structures without surfacing, 52 to 105 ft wide; 1.16 miles asphaltic concrete intersection roads; and a 0.17-mile section of 8-in. cement concrete pavement.

There are five highway grade separations, two bridges and one 103.1-ft plate girder railroad grade separation. Three of these separations are 44 ft long; one is 88 ft; another is 100.3 ft and the two bridges are each 60 ft long. All these structures are reinforced concrete rigid frame arches.

The contract went to Johnson, Drake & Piper, Inc., New York, whose low bid was 0.14% below the second low bid. All bids were below the engineer's estimate that represented the maximum the Department would pay.

Minimum wage rates range from $2.50 for unskilled labor to $3.90 for skilled labor.

The bidders include.

1C	Johnson, Drake & Piper, Inc., New York, N. Y.	$2,635,834
2	Elmhurst Contracting Co., Inc., Corona, N. Y.	2,639,624
11	John Arborio, Inc., Poughkeepsie, N. Y.	3,122,249
EE	Dept. of Public Works, Albany, N. Y	3,369,000

Bids 2-23-56 Items	Unit	Quantity	Unit Prices	
			1C	2
Clear & grubb	ls	job	$65,000	$65,000
Compaction control bldg	ea	1	1,000	1,000
Water equip, f	ls	job	1,200	1,000
Water, apply	mgal	500	3.00	3.00
Excav, unclassif	cy	780,700	0.60	0.70
trench culv & bridge	cy	43,735	3.00	2.20
Road sect, trim	lf rd	42,700	0.75	0.50
Fine grade, prepare	sy	23,900	0.30	0.30
Pipe, vit, sewer, 15"	lf	4,000	5.00	5.00
18"	lf	2,400	7.00	7.00
24"	lf	1,100	11.50	11.50
8"	lf	720	2.00	1.70
underdrain, 6"	lf	8,210	1.00	1.00
8"	lf	2,130	1.10	1.30
CMP, oblate, 11x18"	lf	150	4.50	5.00
CIP, 30"	lf	1,100	29.00	25.00
RCP, culv, 15"	lf	16,100	3.00	3.20
18"	lf	1,200	4.00	4.00
24"	lf	1,200	5.50	6.00
30"	lf	200	8.50	9.00
36"	lf	1,000	10.00	10.00
48"	lf	100	16.00	18.00
Portland cement, type 2	bbl	18,205	4.50	4.50
2A	bbl	2,640	4.00	4.50
6A	bbl	19	10.00	10.00
Natural cement, type N	bbl	4,395	4.50	4.50
Cal chloride, f&p	t	10	75.00	72.00
Conc, cl 1A, for struct	cy	11,415	54.50	45.00
cl 1	cy	300	30.00	32.00
cl 3	cy	280	25.00	30.00
Masonry, stone	cy	640	120.00	150.00
dimension	cy	590	315.00	330.00
rubble stone	cy	153	40.00	80.00
Met reinf for conc pave	syp	2,350	1.00	0.70
Stl fabric reinf	sy	2,105	1.00	0.60
Joint supports, long opt	ea	300	1.00	0.60
transv opt	lf jt	240	2.00	1.40
Bar reinf for struct	lb	1,528,400	0.16	0.15
Struct steel	lf	335,300	0.17	0.20
Metals, misc	lb	49,440	0.30	0.20
Guide railing, cable, opt	lf	1,800	2.50	2.75
timber, low	lf	1,200	3.00	3.30
Railing, met	lf	445	11.00	11.00
Gravel, fndn crse, ROB	cy	4,020	2.00	2.70
fndn crse	cy	5,750	2.00	2.80
Broken stone, bott crse	cy	75	10.00	11.00
Bit mac pen method asph, bott crse	cy	2,400	9.00	10.00
Pave CC with carbon black	cy	240	25.00	30.00
CC	cy	520	20.00	20.00
Asph conc, opt	t	2,837	11.00	12.00
Top crse, grad gravel	cy	550	7.00	8.00
Bit material	gal	2,860	1.00	0.70
Membrane waterproofing	sy	300	2.00	1.80
PC for membr waterpr	sy	300	3.00	4.80
Bit matl, A paving	gal	44,200	0.17	0.20
T road tar	gal	2,200	0.25	0.25
T road tar	gal	2,200	0.25	0.25
Traffic, maint & protect	ls	job	36,500	36,500
Stone filling	cy	20	15.00	12.00
Riprap, dry	cy	150	25.00	24.00
Cofferdams	sf	11,500	0.10	0.01
Piles, steel sheet	sf	490	4.50	4.50
timber sheet, temp	sf	23,560	0.10	0.60
stl bearing, test	lf	360	18.00	18.00
reinf points	lf	200	25.00	26.00
stl bearing	lf	7,600	4.50	5.00
reinf points	lf	3,200	6.50	7.00
splices	ea	150	10.00	70.00
Equip, pile driving, f	ls	job	3,000	2,400
Curb, conc, type D	lf	2,500	1.50	2.00
temp	lf	510	2.00	2.00
white	lf	510	1.50	2.00
Cobble gutters	sy	1,900	6.00	5.00
Catch basin, type A	ea	55	140.00	120.00
type B	ea	47	145.00	120.00
type C	ea	90	50.00	90.00
type D	ea	45	80.00	90.00
ROW markers, granite	ea	188	10.00	12.00
Sidewalk, conc	sy	480	5.00	5.00
Timber & lumber	Mfbm	9	300.00	300.00
Emulsf carbon black	lb	3,710	0.15	0.12
Barricade, hy RR	lf	300	8.00	9.00
Gravel fill, ROB	cy	19,130	3.00	2.75
Topsoil, pl from stockpil	cy	2,300	1.00	1.50
Seeding	ac	84.6	250.00	300.00
Sodding	sy	6,700	1.00	1.50
Tree wells & tree walls	cy	60	40.00	50.00
Gd railing, timb, type D	lf	2,575	3.50	3.50
RR protection	ls	job	5,000	4,000
Fibre conduit, 3", f&p	lf	5,500	0.80	0.70
4", f&p	lf	12,000	0.85	0.90
Manhole, double, B	ea	12	100.00	800.00
stagg	ea	4	100.00	780.00
A	ea	2	450.00	500.00
Condt & bend, galv, 3", f&p	lf	500	5.00	4.00
4", f&p	lf	900	8.00	5.00
Condt clay, lower	lf	500	2.00	6.00
f&p	lf	160	3.00	9.00

To be completed: 9-1-57

Water Main, Louisiana

The installation of this 6,300-lin ft asbestos cement water main with a timber pile canal crossing costs the East Jefferson Parish Water District No. 1 $8,048. T. Edward Ernst of New Orleans, La., is consulting engineer.

The contract awarded to Paul E. Riviere of Metairie, New Orleans requests that all underground iron be coated with 3/23 in. of bitumatic enamel. All materials are furnished by the owner. The contract price includes the canal crossing.

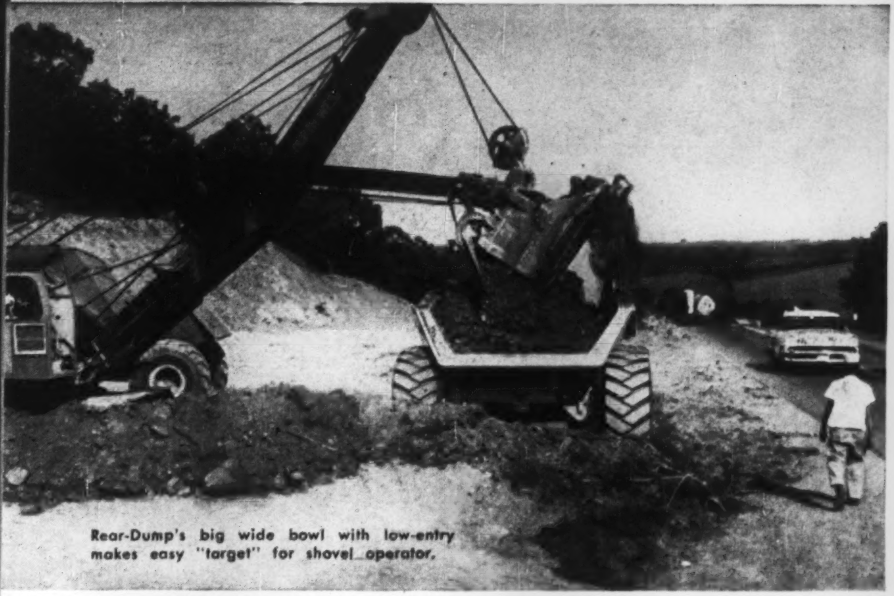
Non-union wage rates are $2.25 for skilled labor, $1.50 to $1.75 for semi-skilled, and $1.25 for common labor.

Bidders include:

1C	Paul E. Riviere, Metairie, New Orleans, La	$8,048
2	Clement Betpouey, Jr. & Co., New Orleans	8,757
4	Kelly-Generes Const. Co., Inc., New Orleans	14,888

Bids: 3-8-56 Items:	Unit	Quantity	Unit Prices	
			1C	2
Pipe, asb cmt, 6"	lf	6,300	$1.10	$1.21
Gate valv, 6"	ea	10	20.00	14.00
Fire hydrants	ea	13	25.00	37.00
Fittings, CI	t	2.25	250.00	200.00
Connections, wet	ea	1	30.00	63.00

Time to complete: 20 calendar days
Liquidated damages: $25.00 per day



Rear-Dump's big wide bowl with low-entry makes easy "target" for shovel operator.

Speed 350,000-yd. job

on U. S. Route 460 with 3 Tournapull Rear-Dumps

To widen U. S. Route 460 in Campbell County, Va., from 2 lanes to a 4-lane divided highway, Talbott-Marks Company, Inc., Clarksville, Va., has 350,000 yds. of shale and rock to haul from cuts to fills. Equipment brought in by contractor to handle job included 3 C Tournapull Rear-Dumps and one 1½-yard shovel.

Production figures on a typical 5000′ cycle showed each C Rear-Dump averaged 10 trips per hour. Loads per machine averaged 10 yds. Each rig hauled 100 yards per hour to total 300 yards for the three. Haul route was in fair condition with 7% return grades. Speed and maneuverability of LeTourneau-Westinghouse units kept them well ahead of loading shovel. 90° turn-ability of Rear-Dump lets operator swing hauler quickly into position at shovel for elimination of spotting delays.

Owner A. W. Talbott says units are "Very satisfactory." Two of his Rear-Dumps were driven 354 miles to this job from Hereford, Md., in 18 hours, where they had worked on a 300,000-yd. rock section of the Baltimore-Harrisburg expressway.

If you have a hauling problem, it will pay you to investigate the LeTourneau-Westinghouse Rear-Dump. Write or call us for further production studies and specifications. There's no obligation.

Passing on incline, Rear-Dumps speed along haul route on big, single, low-pressure tires.

There's a size to fit your needs

Model	Capacity	HP	Overall Length
D	11 tons	138	25′2″
C	22 tons	208	30′
B	35 tons	293	37′3″

Model	Width req'd, non-stop 180° turn Travel position	Dump position
D	24′8″	19′2″
C	28′8″	20′8″
B	35′	27′

Check these advantages as applied to your job

Hauls anywhere — Big single low-pressure tires let Rear-Dumps safely travel narrow haul roads, paved highways, city streets . . . haul cross-country over roughest terrain, through muck and soft fills.

Turns in less space — This Rear-Dump makes 180° non-stop U-turn by power steer in less than its own length. It eliminates time normally wasted see-sawing to back into or turn in narrow quarters.

Reduces maintenance — Because these Rear-Dumps have no jack lines, no long drive-shaft, no frame, subframe, springs or tie rods, most common troubles of conventional rear-dump haulers are eliminated.

Dumps fast, clean — Flick of switch activates hoist motor. Body lifts quickly to any desired angle for spreading on run. At full dump position, bowl-lip is behind rear wheels so dump can be made clean over bank. Streamlined body sheds material readily.

Cuts weather delays — Power-transfer differential automatically applies power to drive wheel on firmest footing . . . pulls unit through mud, sand, soft materials which stop ordinary haulers. It's a Tournapull exclusive.

Resists body shock, damage — Three-layer, all-steel, grid-type bowl with tool-steel floor resists loading shocks. Big, wide bowl opening (8′9″ x 10′10″) is easy target for any loading unit.

Improves safety — Multi-disc air brakes have more braking surface on one wheel than most haulers have on all 4. Low center of gravity, good visibility, front-wheel drive, easy control all contribute to maximum safety.

Delivers full power — Torque converter (optional in C size) automatically balances load and torque so you get full horsepower always. Lugging is reduced; shocks in transmission and final drive virtually eliminated.

Reduces fatigue — Big low-pressure tires, 24.00 x 25, and air-foam cushion seat smooth out ride for operator. Electric push-buttons control power steer and 2-way power dump. Eliminated is loss of momentum and all manual work of fighting balky levers.

Insures future earnings — Behind Tournapull prime-mover, you can interchange rear-dump with scraper, bottom-dump, crane, flatbed. These trailing units lower your investment, let you handle any future job efficiently, help you keep your Tournapull profitably busy the year-around.

Tournapull—Trademark Reg. U.S. Pat. Off. R-929-H-b

LeTW

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- June 14 — Iron and Steel Products; Pipe
- June 21 — Wood Products, Glass, Explosives, Chemicals
- June 28 — Clay Products, Lime, Plaster Paint, Roofing, Wage Rates, Building Board, Lath, Insulation

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C/L lots cash, dis. not deducted			SAND AND GRAVEL Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG Per ton, carload lots, f.o.b. plant		CONCRETE BLOCK 8x8x16-in.ᵃ truckload del.ᵃ per block		CONCRETE Ready Mixed 1:2:4 ove.
	Paper	Bulk	Mortar	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand grav.	Lt. wgt. agg.	50 c.y., del.
Atlanta	$4.12a	$3.71a	$3.61	$2.75	$2.75	$2.50‡	$2.14	$2.24	$1.45	$1.65	$0.18	$0.195	$13.25g
Baltimore	4.04a	3.63a	3.43	2.70‡a	2.70‡a	2.20‡a	2.75‡a	2.80‡a	1.95‡a	1.90‡a	.18	.18a	12.15
Birmingham	3.73	3.00e	....	2.53n	2.53n	2.13n	2.75	2.75	1.55	1.65	.18	.18	11.55
Boston	4.75b	4.29b	4.55	3.00a	3.00a	3.00a	1.65a	1.75a	....	....	.23	.265a	14.00h
Chicago	3.98a	3.57a	3.72	3.60‡b	3.60‡b	4.00‡b	3.75‡b	3.75‡b	2.25‡	2.25‡	.24	.24b	13.00
Cincinnati	4.20c	3.80c	3.89	2.19‡c	2.24‡c	2.24‡•	2.54‡c	2.54‡c	....	....	.205	.25a	12.40
Cleveland	N.A. in C.L.	3.59	....	2.15ef	1.95f	1.65	4.10‡a	4.10‡a	3.35‡a	3.15‡•	....	.23	16.15
Dallas	3.35a	2.95a	3.23	2.42	2.53	1.84	2.22	2.38	....	....	.11e	.2675	11.25
Denver	4.59a	4.09a	4.59	1.85	2.00	1.20	....	....	....	....	.23	.255a	10.70
Detroit	4.05a	3.45a	3.70	4.25‡b	4.25‡b	4.00‡b	3.75‡	3.75‡	3.50‡	3.50‡	.22	.22a	14.20
Kansas City	4.20b	4.00b	4.00	1.65	1.65	2.10‡a	2.00‡a	2.00‡a	....	....	.20a	.24c	13.00b
Los Angeles	4.92ch	4.46ch	5.40	2.41‡a	2.76‡a	2.41‡a	2.41‡a	2.46‡a	....	....	.145fm	.255m	12.96lh
Minneapolis	4.39a	3.98a	3.89	2.70‡ag	2.70‡ag	1.60‡ag	3.25‡ag	3.25‡ag	....	....	.19	....	12.85f
Montreal	3.11d	2.86d	3.50	1.95‡a	2.20‡a	2.25‡a	1.95‡i	2.20‡i	....	....	.20	.20a	10.80ek
New Orleans	3.55a	3.15a	3.48	2.44	2.44	2.00	....	....	1.45	1.65	.275	....	13.65
New York	4.41a	4.00a	3.73	3.05bk	3.05bk	2.00bk	2.90bl	2.90bl	....	....		....	15.70an
Philadelphia	3.88/4.27‡a	3.57/3.94‡a	3.49/4.12‡	2.85‡op	2.85‡op	2.35‡op	2.70‡	2.80‡	2.00	2.35	.22/.28	....	13.20de
Pittsburgh	4.15a	3.76a	3.75	2.40‡	2.40‡	2.20‡	2.60‡	2.60‡	2.15	2.15	.25d	.31	14.00
St. Louis	3.86/4.18e	3.46/3.78e	3.71/4.03	3.25am	3.10am	2.40/3.10am	1.75j	1.75j	....	....	.22	.28c	12.90
San Francisco	4.03e	3.59e	....	2.02	2.02	2.12	2.17	2.17	....	....	.24	.28cl	12.50c
Seattle	4.30a	3.75a	....	4.00‡bm	4.00‡bm	4.00‡bm	4.50‡bm	4.50‡bm	....	....	.28	.38	13.30j
Toronto	3.97	3.77	3.77	2.25‡	2.25‡	1.85‡	2.00	2.00	2.00	2.00	.25	.31c	14.15

‡ Delivered. * Prices incl. dealers discount except as noted.

CEMENT: •a Less 10¢ disc, 15 days. •b Less 2% disc, 15 days. •c Less 10¢ disc, 10 days. •d Truckload lots, deliv. 10¢ disc, 20 days. •e Truckload lots, destination price. •h LCL.

SAND GRAVEL, STONE & SLAG: •a Truck lots. •b Per cu. yd. •c 5 tons or more. •e ½". •f Pea gravel. •g Less 5% for cash. •h Less than 5 tons. •i Plus 5% mun. & prov. tax •j F.o.b. quarry. •k Barge lots asd. •l F.o.b. scow Hudson river. •m Less 2% for cash. •n F.o.b. cars. •o 1-3 mi zone. •p Add 10¢ for ea. add'l mi zone.

CONCRETE BLOCK: •a Cinder •b Waylite. •c Haydite. •d Celocrete •e 5¼ x 8 x 12 in. •f 8 x 4 x 16. •g F.o.b. truck at job. •i Less 2% for cash •l F.o.b. plant San Rafael. •m F.o.b. yard.

READY MIXED CONCRETE: •a 5 cu. yds. or over del. Man. •b 25 cu. yds or more •c 10-100 cy. brackets. •d 1-3 mi. zone. •e 2,000 lb comp. •f 2,500 lb. comp. •g Less 25¢ disc, 15 days. •h Less 50¢ for cash. •i 5% off for cash. •j 2% off for cash. •k Federal tax included. Add 5% mun. & prov. •l 1:2½:3½. •m F.o.b. yard. •n Plus escalator clause. •o Add 15¢ for ea. add'l 3-mi zone.

CASH DISCOUNTS CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10¢ per bbl. for payment within 15 days of date of invoice. Subject discount 10¢ per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For paper bags add 40¢ per bbl., not refundable.

	Bulk		Bulk		Bulk		Bulk		Bulk
Richard City, Tenn	$3.05†	Buffington, Ind	$3.10†	Steelton, Minn	$3.20†	Muskegon, Mich	$3.15†	Toledo, O	$3.15†
Clinchfield, Ga	3.05†	Independence, Kan	2.95†	Leeds, Ala	3.00†	Saginaw, Mich	3.15†	Milwaukee, Wis	3.20†
Kingsport, Tenn	3.05†	Hannibal, Mo	3.10†	Duluth, Minn	3.20†	Wyandotte, Mich	3.15†	Green Bay, Wis	3.20†
West Des Moines, Iowa	3.10†	Northampton, Pa	3.05†	Hudson, N. Y	3.05†	Buffalo, N. Y	3.25†	Ironton, O	3.15†
Nazareth, Pa	3.05†	Universal, Pa	3.20†	Alpena, Mich	3.05†	Oswego, N. Y	3.30†	Montreal City	2.56†
Bath, Pa	3.05†	Waco, Tex. (+ 10¢ tax)	3.10†	Detroit, Mich	3.15†	Cleveland, O	3.20†	W. Winfield, Pa	3.20†

† *Prices to hold for Second quarter of 1956.*

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT Per ton, less than 80 penetration		ASPHALT BINDERS FLUXES Per gal., 80-300 penetration		CUTBACK ASPHALT MC per ton		ROAD OIL	ASPHALT EMULSION RSI Per gal.	
	Granite Per M lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	Tank car	Drums	Tank car	Drums	Tank car	Drums	Per gal. Tank car	Tank car	Drums
Atlanta	......	......	......	$27.60	$40.00	$0.115	$0.23	$0.114Pw	$0.276Pw	$0.15	$0.15	$0.25
Baltimore	150.00‡		......	21.50i	......	.092i	0.182i	.10iwE	.195iwE	.10i	.105i	0.195i
Birmingham	......	62.00i	......									
Boston	......	......	......	22.00ap	35.00ap	22.00as	30.00as	.095aFw	.195aFw	.095a	.095aG	.175aG
Chicago	155.00‡	85.00‡b	3.95/4.00‡j	21.85b	31.85b	20.85bs	30.85bs	.10bwH	.18bwH	.085	......	......
Cincinnati	......	......	......	......	......	......	......	......	......	......	......	......
Cleveland	......	82.00d	5.60g	23.00A	......	23.00A	......	.1025AwF	......	......	.1025AG	.20AG
Dallas	e	40.00	e	24.45	43.19	.1030	.1858	28.91	50.44	.098	.1087	.1960
Denver	......	50.00	......	......	......	......	......	......	......	......	......	......
Detroit	......	112.00	......	29.65	......	29.65v	......	.1285wI	......	.1026	......	.25
Kansas City	e	e	e	8.00cl	......	17.40v	......	.075•wJ	......	.065c	0.11	......
Los Angeles	e	......	e	18.50dmx	......	18.50dvz	......	20.00dzK	......	19.00dv	.09j	.19j
Minneapolis	......	......	3.33h	26.50	......	25.00	......	0.115w	......	0.105	.1242	......
Montreal	e	e	e	27.00n	39.60n	.135n	.198n	16.50nuE	20.90nuE	.132n	.197ns	.239ns
New Orleans	......	......	......	17.60e	o	17.60es	o	.085ew	o	.085B	.085BI	......
New York	......	......	3.90f	23.89qCD	44.56qD	23.89stCD	44.56stD	.1073wCDF	.1939wDF	......	.1073CD	.1968D
Philadelphia	175/185	110/120	4.08	22.00	......	22.00	......	.095uF	......	.095	......	......
Pittsburgh	165.00	48.00	4.60	27.00	38.00	.10	.21	27.00E	40.00E	.098	.11	.224
St. Louis	......	......	......	20.63O	......	.1764	......	.0925fwM	......	0.16	.105	......
San Francisco	......	70.00c	......	20.50g	37.50g	20.50gks	37.50gks	21.50gN	39.00gN	21.25sv	.0925y	.1825v
Seattle	......		......	24.50z	38.50h	18.75hs		26.00K		22.25hs	.0925h	.1025hr
Toronto	......	......	4.03	33.80	55.14	0.19	0.24	0.20w	0.25w	0.20	0.20	.24

h Delivered.

PAVING BRICK & BLOCK: •a CL. •b 3 x 4 x 8. •c 2¼ x 8¼ x 4. •d LCL, truck deliveries. •e Not used. •f 2" Interior 6# treat. •g 3" •h 2" tr, 8# •i 3 x 3⅝ x 8½. •j 2½", 6 lb. tr.

ASPHALTS: •a Price at plant, Everett, Mass. •b F.o.b. refinery, Lockport, Ill. •c F.o.b. Sugar Creek, Mo. •d F.o.b. refinery, El Segunda. •e F.o.b. Baton Rouge. •f F.o.b. Hartford, Ill. •g F.o.b. Richmond, Calif. •h F.o.b. Martinez. •i F.o.b. refinery, Baltimore. •j F.o.b. refinery, Inglewood, Calif. •k 50-110 penetr. •l Less than 100 penetr. •m 40-80 penetr. •n Fed. tax included; add 5% for mun. & prov. •o Drums not avail. Shipped in steel bbl. •p 60-70 penetr. •q 40-85 penetr. •r In customer's drums. •s Shipped in drums, per drum. •t 85-200 penetr. •u Per 100 gal. •v Per ton. •w Per gal. •x Also tank trucks. •y F.o.b. Oakland •z F.o.b. Edmonds •A F.o.b. refinery, Cleveland. •B F.o.b. Destrehan, La. •C Bulk. •D Prices based on transporting to Manhattan via truck. •E RC. •F Also RC. •G Also MS, SS. •H RC 0-5 incl. •I MC 4. •J MC, RC .0675. •K MC 3, 4 & 5. •L Ms. •M MC 1-5, RC 1-5, .089. •N MC 3. • fob Roxanna, Ill •P F.o.b. refinery Savannah: $0.09 gal., tank cars; $0.20 gal., drums.

Keeping haul road open, "660" grader leveled ruts at high speed, made it easy for scrapers to maintain high production. Job was one of many Adams grader handled on this highway job.

"Saves us many hours"

says Wisconsin Contractor

"The Adams power-shift moldboard gives grader long reach—*fast*," said Phil Frank, partner in Frank Brothers, Milton, Wis. "Grader does not have to be maneuvered out of its line of travel for extra blade reach when sloping banks, grading shoulders, etc. This saves us many hours. It's the best grader I have seen for cutting backslopes."

Frank Brothers used their Adams "660" along with 4 C Tournapulls on a project relocating 1½ miles of Wis. Hwy. 58, six miles south of Mauston. Part of this job included building a ditch to change the course of a stream which intersected the right-of-way. The grader patrolled the haul roads, finished backslopes, scarified sandstone rock for scrapers, leveled fill, handled finish-grading.

One-piece frame resists shocks

The heavy, box-construction, one-piece, streamlined frame of this husky grader is built to resist load shocks and stresses. Weight is distributed to make use of full power in all gears. Big, powerful engine starts quickly in any temperature; has lugging ability to move heavy loads. Constant-mesh transmission gives smooth speed through all gears.

8 Forward speeds . . . to 26 mph

There's a speed to fit the work load of every grading operation. This means more applied power, greater accuracy. You get work done fast, save time moving job-to-job. Three additional "creeper speeds" (.23 to 1.82 mph) are optional. These "slow-motion" speeds make it easy to rip hard-packed roads and old asphalt, root out unseen roots and stones without severe shocks, give you accurate finishing in tight places.

4 Reverse speeds . . . to 13 mph

Wide range of reverse speeds saves time on shuttle-grading and mixing, backing to buck snow drifts, etc. *No other grader offers this wide range of operating speeds.*

Double-action hydraulic brakes

Service brake applies braking action to transmission as well as wheels; surer, safer stops are possible, with less pedal effort.

Rubber-mounted engine

Vibration is not transmitted through floor to machine and operator. Means less maintenance, better operator efficiency all day long.

See Adams before you buy

Select your next motor grader on the basis of *performance*. Ask your LeTourneau-Westinghouse Distributor for performance facts and specifications. Learn why Adams graders do *more* work, in *less* time, at *lower* cost. You be the judge!

High-angle blading of ditches found Adams "660" holding steadily to contour. Blade held precisely to cut with equal pressure at all points.

A size ADAMS for every need

Model 660—150 hp diesel engine, 27,730 lbs.
Model 550—123 hp diesel engine, 23,500 lbs.
Model 440—104 hp diesel engine, 21,500 lbs.
Model 330— 80 hp diesel engine, 20,500 lbs.
Model 220— 60 hp diesel engine, 14,865 lbs.

TraveLoader—A high-speed, heavy-duty, self-propelled, belt-type loader for picking up materials and loading into trucks from windrows or stockpiles. Your choice of 55 hp gasoline or 60 hp diesel engine, 16,800 lbs.

AG-8-G-bw

LeTourneau-WESTINGHOUSE Company
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company

HELTZEL
FLEX-PLANE
RECORD OF PERFORMANCE

Another

"The performance of this machine speaks for itself," says Sidney Steel, paving superintendent of the Austin Paving Co. "Our records tell us this machine has long since paid for itself and it still has years of work left in it."

Austin Paving Company of Dallas, Texas put down 5,580 sq. yards of concrete in one day with single Flex-Plane Finisher!

Speed, power and flexibility, designed into the Flex-Plane, enabled it to easily keep pace with a dual drum paver while making two passes over the roadway, without benefit of a spreader.

WORLD'S LARGEST BUILDER OF CONCRETE FINISHING EQUIPMENT

Paving Record* for...

Flex-plane

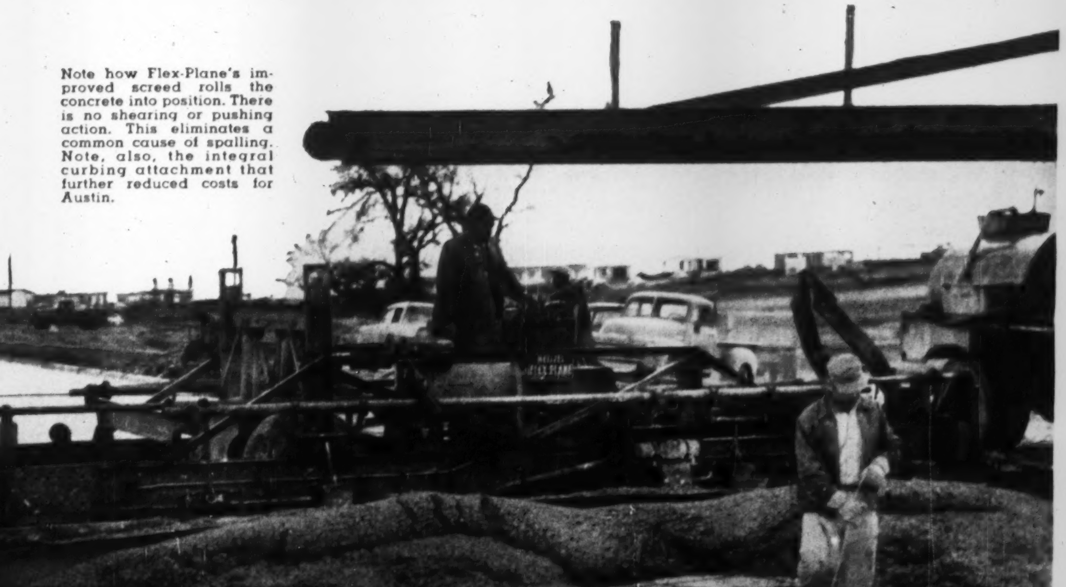
● A Flex-Plane Portable Finishing Machine recently spread and finished 1860 lineal feet of 27-foot width street, with 6" integral curbs on both sides, in a single day for the Austin Paving Company of Dallas, Texas.

"Taking the concrete as it came from a single dual-drum paver, the Flex-Plane machine spread and finished it to a degree that required a minimum of hand finishing. It's a great piece of equipment!" says Sidney Steel, Paving Superintendent for Austin.

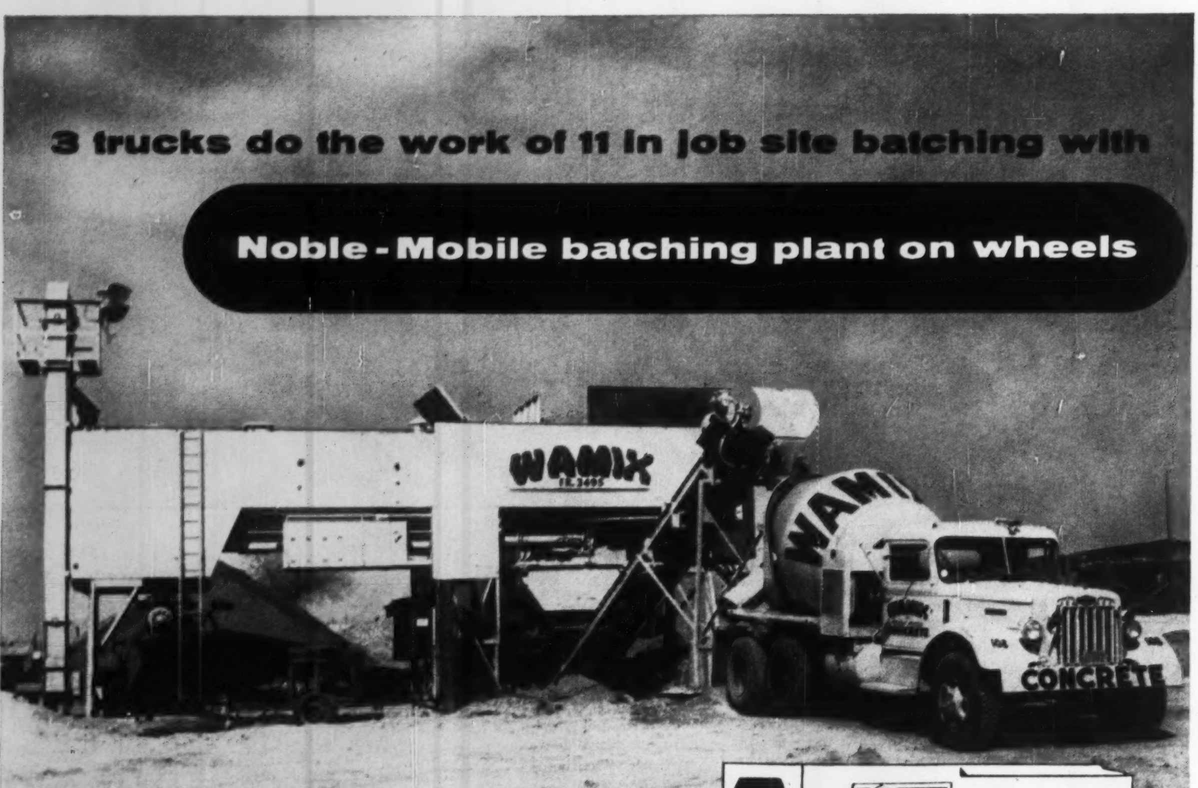
The Austin machine was equipped with integral curb attachments on both sides, and according to Steel, this feature alone saved them many pouring hours.

It's this kind of performance that has made the Flex-Plane, the industry's fastest selling and most desired finishing machine. Why not let our sales-engineers put you in touch with a Flex-Plane user in your area. His story will convince you that, if you do any roadway or runway paving at all, you can't afford to be without a Flex-Plane.

THE FLEXIBLE ROAD JOINT MACHINE COMPANY
7400 THOMAS ROAD • WARREN, OHIO

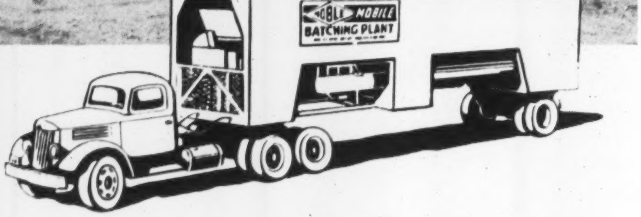


Note how Flex-Plane's improved screed rolls the concrete into position. There is no shearing or pushing action. This eliminates a common cause of spalling. Note, also, the integral curbing attachment that further reduced costs for Austin.



3 trucks do the work of 11 in job site batching with

Noble-Mobile batching plant on wheels



Comparatively small investment in Noble-Mobile eliminates the cost of 8 additional trucks that would be required for the 14 mile haul if batching were done at the base plant, reports Joseph Amis, Wamix, Inc., Dallas, Texas. On this Centex Construction Co. housing project, Noble-Mobile is supplying 50,000 yards of concrete for 1500 slab foundations.

Hauled along highway like semi-trailer • Set up in one day—no field wiring, foundations or crane time required on base plant • Aggregates charged with front end loader, crane or conveyor • Bulk cement utilized ... batched automatically • Excellent quality control Maximum production from mixer trucks—short hauls, more yards per day • Production capacity 60 to 100 yards per hour • Covered by patents pending.

NOBLE BATCHING PLANTS

Portable, semi-portable or stationary plants designed and built by Noble Company · 1860 - 7th St., Oakland 20, Calif. TEmplebar 2-5785

Other Noble Company offices: 20950 Center Ridge Road, Cleveland 16, Ohio. EDison 1-3426.
518 First Ave. North, Seattle, Wash. MUtual 4878 · 117½ W. Manchester, Inglewood, Calif. ORegon 8-4457.
International Sales Agent: Frazar International Corp., San Francisco

DISTRIBUTORS

BIRMINGHAM, ALA., Equipment Service Co. • PHOENIX, ARIZ., Superior Equipment Co. • VANCOUVER, B. C. Westcoast Equipment Co., Ltd., • DENVER, COLO., Western Machinery Co. • HARTFORD, CONN., T. B. Holmes & Sons, Inc. • CEDAR RAPIDS, IOWA, James W. Bell Co. • INDIANAPOLIS, IND., Manwaring Machinery Co. • DETROIT, MICH., R. G. Moeller Co. • ST. PAUL, MINN., Borchert-Ingersoll, Inc. • CLEVELAND, OHIO, Wepco Equipment Co. • LOS ANGELES, CALIF., Smith-Booth-Usher Co. • PORTLAND, ORE., Loggers & Contractors Machinery Co. • PHILADELPHIA, PA., Furnival Machinery Co. • PITTSBURGH, PA., Equipment & Supplies, Inc. AMARILLO, TEXAS, Plains Machinery Co. • DALLAS, TEXAS, North Texas Equipment & Supply Co. • HOUSTON, TEXAS, Boehck Engineering Co. • EL PASO, TEXAS, Border Machinery Co. • WACO, TEXAS, Richards Equipment Co. • SAN ANTONIO, TEXAS • Contractors Machinery Co. • SALT LAKE CITY, UTAH, Arnold Machinery Co. SEATTLE, WASH., Star Machinery Co. • SPOKANE, WASH., Intermountain Equipment Co. • CASPER, WYOMING, Studer Tractor & Equipment Co.

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

† **Mass., Chicopee**—SCHOOL—BA 6/12—Education Div., Community Facilities, c/o Contr. Officer, Westover Air Force Base, elementary school, Westover Air Force Base. $300,000. Plans deposit $7.50, refundable. CD 1/16.

HEAVY CONSTRUCTION—LB & CA

† **Plantations Constr. Co., Inc.**, 1089 Greenwich Ave., Warwick, R. I., LB **$105,029**, est. $106,000, sewage treatment plant, Naval Air Station, NOy 91011, Spec. 48727 Ext., QUONSET POINT, R. I. First Naval Dist., 495 Summer St., Boston, Mass. Bids May 22. CD 5/10.

† **Central Transformer Co.**, 2400 W. 6 St., Pine Bluff, Ark., CA, **$99,958**, est. $100,000, area power transformers, Hartford Research Center, ENG-19-016-56-127, MIDDLETOWN, CONN. U. S. Eng., 150 Causeway St., Boston, Mass.

† **Hartwell Co.**, 33 Sutton Ave., East Providence, R. I., LB **$169,300**. heating mains repairs, Buildings 29 and 157, U. S. Naval Submarine Base, NOy 90357, Spec. 49035, NEW LONDON, CONN. Dist. P. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York 7, N. Y. Bids May 23. CD 5/9.

BUILDINGS—LB & CA

Gerald K. Kelleher, 258 Copeland St., Brockton, Mass. CA Approx. **$130,000**. WAREHOUSE, RAYNHAM, MASS. R. F. Owens Co., Inc., 630 Montello St., Brockton, Mass. CD 4/17.

DeLuca Constr. Co., 27 Crescent St., Glenbrook, Stamford, Conn., CA **$272,500**. WAREHOUSE and OFFICE, DANBURY, CONN. Newmont Exploration Ltd., c/o Massari & Raymond, archts., 65 South St., Stamford, Conn. Bids May 8. CD 5/2.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

† **Md., Cumberland**—STORAGE AREA—BA 6/14—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va., storage area; Naval and Marine Corps Reserve Training Center, NBy 3607, Spec. 3607/56. Plans deposit $25.

BUILDINGS—BA

N. J., Paramus—CHILDREN'S HOME, etc.—BA 6/11—Bd. Freeholders Bergen Co., Administration Bldg., Hackensack, Senior Children's home and Mental Health Diagnostic and Treatment Center. Robert J. L. Cadien, 570 Gorge Rd., Cliffside Park, archt.

▲ **Pa., Phila.**—HOSPITAL—BA 6/11—Office Vincent G. Kling, archt., 917 Corinthian Ave., Phila., 6 story, 46x195 ft., brick, concrete block hospital new wing addn. for Episcopal Hospital, Front and Lehigh Ave. $2,000,000. Chester I. Duncan & Son, 225 S. 15 St., Phila., engrs. CD 1/13/54.

▲ **Pa., Unionville**—SCHOOL—BA 6/11—Unionville-Chadds Fords Joint School Dist., R.D. No. 1, Kennett Square, 1 and 3 story, bsmnt., brick, block, Junior-Senior High School. $1,000,000. Buchart Engineering Co., 111 W. Market St., York, archt. CD 3/8/55.

† **Md., Fort George G. Meade**—DISPENSARY—BA 6/20—U. S. Eng., 24 St. and Maryland Ave., Baltimore, Zone 18, masonry regimental dispensary, utilities, site imprvs., ENG-18-202-56-28. $350,000. Plans deposit $25. McGaughan & Johnson, 2000 P St. N.W., Wash. 6, D. C., engrs.-archts. CD 5/16/51.

HEAVY CONSTRUCTION—LB & CA

Antonio Mondo, 2614 Lodi St., Syracuse, N. Y. LB **$233,631**, est. $250,000. installing 30 in. prestressed concrete pipe, Marcellus, SYRACUSE, N. Y. Onondaga County Water Auth., Onondaga Court House, Syracuse, N. Y. Bids May 16. CD 5/4.

† **Lam Bldg. Corp.**, 1001 Wood St., Phila., Pa., LB **$84,555**. Buildings 125 and 196 rehabilitation, Naval Air Station, NOy 89931, Spec. 48614, LAKEHURST, N. J. Dpt. Navy, Phila. Naval Base, Phila., Pa. CD 1/16.

M. & J. B. McHugh, 892 N. Markol St., Phila., Pa. LB **$141,574**. water mains various locations, Bid 2595, PHILA., PA. City, Dpt. Procurement, City Hall Annex, Phila., Pa. Samuel S. Baxter, Phila., Pa., water comr. CD 3/11/46.

† **Fred Loffredo**, 8100 Rodney St., Phila., Pa. LB **$380,000**. Item No. 3, sanitary sewerage sys., pump house, Naval Ammunition Depot at Fort Mifflin, NOy 598, Spec. 598/56, PHILA., PA. Dpt. Navy, Phila. Naval Base, Phila., Pa. Bids Apr. 10. CD 3/14.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

Empire Constr. Co., 31 S. Calvert St., Baltimore 2, Md. LB **$882,157** (7 bidders) dual 3 span continuous steel girder bridges on relocated State Rte. 196 over Paint Branch near White Oak, Contr. M 531-8-320, Montgomery Co. Bids May 22. CD 5/1.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

Interstate Amiesite Co., 265 Delaware Trust Bldg., Wilmington, Del. LB **$93,403** (2 bidders) resurf. 5.26 mi. Rtes. 29, 20 and 150, Contr. B 705-1-420 and B 675-2-420, Baltimore Co. Bids May 22. CD 5/16.

▲† **Blount Bros. Constr. Co.**, Bell Bldg., Montgomery, Ala. CA **$9,930,000**. constr. rotating arm and maneuvering basin at David W. Taylor Model Basin, CARDEROCK, MD. Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids May 23, awarded May 25. CD 5/25, under LB.

Philip D'Adamo Constr. Corp., 4105 Amos Ave., Baltimore 15, Md. LB **$72,242** (10 bidders) Items 13, 14, 15, 16, Contr. 498 D. S. & W. Group Bids, various sections, TOWSON, MD. Comrs. Baltimore Co., County Office Bldg., Towson 4, Md. Bids May 17. CD 5/3.

BUILDINGS—LB & CA

Murphy Quigley Co., 1518 Sansom St., Phila., Pa. CA **$95,000**. GARAGE and OFFICE alterations, PHILA., PA. Manor Realty Co., Penna. R. R. Station, 30 and Market Sts., Phila., Pa.

Severn River Constr. Co., 2 W. University Parkway, Baltimore 18, Md. CA **$350,000**. 2 story, 120x28x16 ft., brick, masonry APARTMENT, Bond and Monument Sts., BALTIMORE, MD. Broadway Development Corp., 2 W. University Parkway, Baltimore 18, Md. Alexander A. Cochrane, 925 N. Charles St., Baltimore 1, Md., archt.

L. B. Smith, Dorsey Rd. and Parkway, Lansdowne, Md. rejected bids May 4, 1 story, concrete, steel, masonry sales and service bldg., BALTIMORE, MD. CD 5/1.

▲ **Terminal Constr. Corp.**, Box 175, Woodridge, N. J. LB **$6,770,000**. Lexington Terrace HOUSING Proj. Md-2-19, 677 units, W. Fayette St., Fremont Ave., W. Mulberry St. and Myrtle Ave., BALTIMORE, MD. Baltimore Housing Auth., 709 E. Eager St., Baltimore 2, Md. Bids May 24. CD 5/15.

▲ **Land & Simmons**, 3922 Hickory Ave., Baltimore 11, Md. LB **$740,000** (1 bidder) combined bid; NURSERY BLDG. and BLDG. for EMOTIONALLY DISTURBED CHILDREN, Rosewood State Training School; LB **$450,000** (2 bidders) BLDG. for EMOTIONALLY DISTURBED CHILDREN, OWINGS MILL, MD. State Dpt. P. Imprvts., 506 Park Ave., Baltimore 1, Md. Bids May 22. CD 5/17.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

Wm. H. Sands, 407 York Rd., Towson 4, Md. CA **$789,390**. masonry Inverness Elementary SCHOOL, Dundalk, TOWSON, MD. Baltimore Co. Bd. Educ., Aigburth Rd., Towson 4, Md. CD 4/25, under LB.

† **Clute Bros.**, Wyoming, Del., LB **$523,360**. ARMORY, DOVER, DEL. Delaware National Guard, 10 and Dupont Sts., Wilmington, Del. Bids May 22. CD 5/10.

SOUTH

HEAVY CONSTRUCTION—BA

† **Virginia**—POWER LINE SUPPORTS—BA 6/12—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Zone 11, replacing power line supports, Harbor Defense Unit, Fishermans Island, NBy 3567, Spec. 3567/56. Plans deposit $25.

† **Va., Dam Neck**—FIRE ALARM CABLE—BA 6/12—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Zone 11, fire alarm cable, Fleet Air Defense Training Center, NBy 669, Spec. 669/56. Plans deposit $25. CD 9/4/52.

† **Va., Yorktown**—PRESS FACILITY—BA 6/14—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, 2,000-ton press facility, Naval Mine Depot, NOy 91457, Spec. 49870. Plans deposit $25.

† **Fla., Jacksonville**—BA 6/15—Dpt. Navy, Naval Base, Charleston, S. C., rehabilitation of existing housing, Bldgs. 800-801-803, Naval Air Station, NBy 5666, Spec. 5666/56. CD 12/3/51.

† **Fla., Mayport**—RESURFACING, etc.—BA 6/15—P. Wks. Officer, Dpt. Navy, Naval Base, Charleston, S. C., resurfacing, paving and drainage, Naval Auxiliary Air Station, NBy-5009, Spec. 4009/56. Plans deposit $10.

† **Fla., Mayport**—BARRACKS REHABILITATION—BA 6/20—P. Wks. Officer, Dpt. Navy, Naval Base, Charleston, S. C., rehabilitation of barracks 5 and 24, Auxiliary Air Station, NBy 4483, Spec. 4483/56. Plans deposit $10.

† **S. C., Greenville**—DENTAL CLINIC—BA—About 7/2—U. S. Eng., 31 Customhouse, Charleston, dental clinic, Donaldson Air Force Base, ENG-38-081-56-62: CD 9/25/51.

BUILDINGS—BA

▲ **Va., Fort Lee**—HOUSING—BA 6/13—U. S. Eng., foot of Front St., Norfolk, Zone 1, construct and finance, Capehart Family Housing, 121 bldgs., 2 to 8 units each; for total of 525 units; off site utilities and imprvs., Fort Lee-Richmond, ENG-44-110-56-28. $7,200,000. Lublin, McGaughy & Assocs., 220 W. Freemason St., Norfolk, archts.-engrs. CD 5/14.

† **Va., Fort Lee**—REGIMENTAL MOTOR PARK BRANCH POST EXCHANGE—BA 6/14—U. S. Eng., foot of Front St., Norfolk, Zone 1, Regimental Motor Park Branch Post Exchange, two battalion headquarters, 2 bldgs., 40x130 ft.; 3,900 sq. ft. post exchange; four bldgs., 40x120 ft., one bldg., 12x24 ft., filling station, fuel storage, ENG-44-110-56-30. $750,000. Lublin, McGaughey & Assoc., 220 W. Freemason St., Norfolk, engrs.-archts. CD 5/18.

▲ **Va., Fort Eustis**—HOUSING—BA 6/20—U. S. Eng., foot of Front St., Norfolk, Zone 1, construct and finance, Capehart Family Housing, 107 bldgs., 2 to 8 units each, total of 600 units, incl. off site utilities and site imprvs., ENG-44-110-56-26. $8,175,000. Mills, Petticord & Mills, 3308 14th St. N. W., Wash., D. C., archts. CD 5/16.

BUILDINGS—SLC

Fla., Miami—NEWS—Weed-Russell-Johnson & Assocs., archts., 550 Brickell Ave., soon let contract, Part 1, electrical work, Miami Daily News Bldg., between N.W. 7 St. and Miami River, for Miami Daily News, 600 Biscayne Blvd., Miami, Fla. Rader & Assocs, Congress Bldg., electrical engrs. CD 1/17.

Fla., Miami—NEWS—Weed-Russell-Johnson & Assocs., archts., 550 Brickell Ave., soon let contract, bulkhead work, Miami Daily News Bldg., between N.W. 7 St. and Miami River for Miami Daily News, 600 Biscayne Blvd., Miami, Fla. Jorgensen & Schreffler, 1200 S.W. 1 St., structural engrs. CD 1/17.

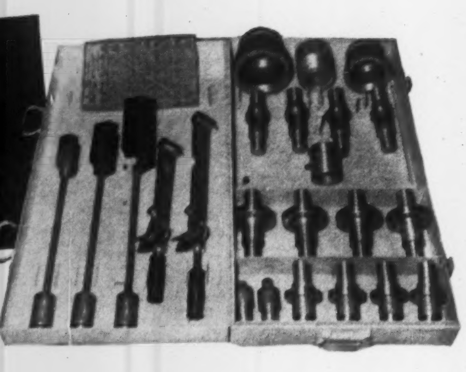
HEAVY CONSTRUCTION—LB & CA

▲† **Virginia Engineering Co.**, 80 Twenty-Ninth St., Newport News, Va., LB **$1,371,000**, (5 bidders) 150-man bachelor officers quarters, mess facilities, Naval Air Station, NOy 91375, Spec. 48295, OCEANA, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids May 22.

WEST VIRGINIA—State Rd. Comn., Charleston, Zone 5, W. Va.—**Andersons's Inc.**, 8 Spring St., Charleston, W. Va., LB **$189,734**, b. conc. 9.15 mi. Bulltown-Lewis County Line Rd. Proj. 3017A & B, Braxton Co.; W. Va.—**Highway Constr. Co.**, 504 Baltimore Ave., Clarksburg, W. Va., LB **$103,425**, b. conc. 10.68 mi.

"IN-PLACE" SHEAR READINGS

FAST, ACCURATE, WITH NEW ACKER VANE TEST KIT!



The Acker Vane Shear Test Kit has everything needed to obtain fast, accurate, "in-place" shear readings to depths of 100 feet!

It's easy to use and provides accurate soils information at low cost! For ease in carrying, the entire set of tools are packaged in a handy steel kit.

Write today for prices and free illustrated folder 700! ENR

Assemble the Vane to the Rod!

Insert in Casing and Apply Pressure to the Torque Wrench!

Consult the Torque Chart for Accurate Reading:

ACKER DRILL CO., INC. 725 W. Lackawanna Avenue
Scranton, Penna.

a complete line of Soil Sampling Tools, Diamond and Shot Core Drills, Drilling Accessories and Equipment

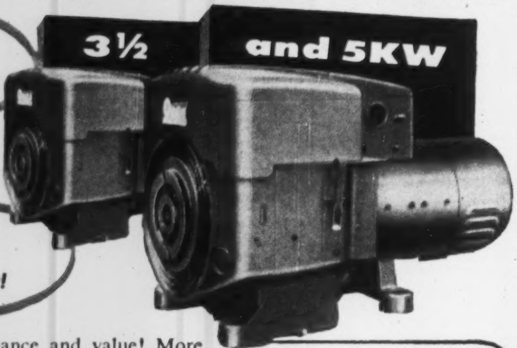
New ONAN CCK Electric Plants

MORE OUTPUT *per pound of weight!*

MORE OUTPUT *per gallon of fuel!*

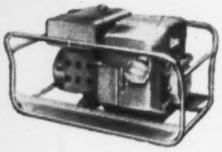
MORE OUTPUT *per dollar cost!*

3½ and 5KW



Way ahead in performance and value! More powerful, two-cylinder, air cooled Onan gasoline engines of 4-cycle, horizontally-opposed design give smooth, quieter, effortless performance. Short stroke and moderate speed cut engine wear, give longer life. Quality features include rotating Stellite-faced exhaust valves, solid Stellite valve seat inserts, full pressure lubrication. Onan's exclusive Vacu-Flo cooling system available for difficult or "buried" installations.

Completely Onan-built, with Onan gasoline engines direct-connected to Onan all-climate generators in compact, rugged units. Available in stationary, portable and standby models with a wide range of accessories.



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Available with carrying frames or 2-wheel dollies. Easily portable. Other Onan portable models: 500 to 10,000 watts.

Write for folder on all CCK models

D. W. ONAN & SONS INC.

2984 University Avenue Southeast, Minneapolis 14, Minnesota

Proj. 3090, 33561 and 3426 (Pt.) Pocahontas Co. Bids May 22. CD 5/14.

† **Southern Roadbuilders, Inc.**, 540 Reynolds St., Box 1129, Augusta, Ga., LB **$598,000.** connecting taxiway and warmup apron, Naval Air Station, NBy-849, Spec. 849/56, JACKSONVILLE, FLA. P. Wks. Officer, Dpt. Navy, Naval Base, Charleston, S. C. Bids May 17. CD 4/24.

▲ **Edward M. Fleming Constr. Co.**, 4121 N.W. 25 St., Miami, Fla., LB **$1,059,265** Base Bid, Greyhound PARK, N.W. 115 St. and N.W. 2 to 15 Aves., MIAMI SHORES VILLAGE, FLA. Biscayne Kennel Club, Inc., 605 First Natl. Bank Bldg., Miami, Fla. Bids May 18. CD 5/9.

ALABAMA—State Hy. Dpt., Montgomery, Zone 4,

G. W. **Norrell Contr. Co., Inc.**, Georgiana, Ala., LB **$81,176.** bridges from U.S. 82 at Mineral Springs Church, S.E. through McShaw, Pickens Co., Proposal B. Bids May 18. CD 5/8, under Streets and Roads.

▲ **ALABAMA**—State Hy. Dpt., Montgomery, Zone 4,

Ala.—**G & R Coal Co.**, Decatur, Ala., LB **$103,582** bit. 3.937 mi. from Calhoum Co. line north to Pine Grove, Cherokee Co.; LB **$117,893**, bit. 5.167 mi. on road from Muscle Shoals E. toward Abernathy Lake, Colbert Co.;

Ala.—**Watson-Strawhorn Contr. Co.**, Fulton, Ala., LB **$133,716**, bit. 4.606 mi. Elrod-Echols Rd., Tuscaloosa Co.;

Ala.—**E. J. Cobb Constr. Co.**, 1925 Mobile Rd., Montgomery, Ala., LB **$98,704**, base, bit. culvert 10.965 mi. 3 county roads, Pike Co.;

Ala.—**Southern Amiesite Asphalt Co., Inc.**, 3401 5 Ave. N., Birmingham, Ala., LB **$73,833**, maintenance resurfacing, Proposal 3, 14.577 mi. Walker Co.;

Ala.—**Farmer Constr. Co., Inc.**, 2152 Halls Mill Rd., Mobile, Ala., LB **$82,558**, maintenance resurf. Proposal 7, 9.599 mi. Mobile Co.;

Ala.—**Hewitt Contr. Co.**, 1509 3 Ave., Columbus, Ga., LB **$139,216**. maint. resurf. Proposal 5, 27.92 mi. Shelby Co.;

Ala.—**Burgreen Contr. Co., Inc.**, Athens, Ala., LB **$596,293**, grading, draining, pavement 10.661 mi. U.S. 31 between Decatur and Athens, Limestone Co.;

Ala.—**Floyd J. Milford**, 3732 5 Ave. N., Birmingham, Ala., LB **$509,058**, bit. paving 3.404 mi. Ala. 20 from Chemstrand to Bank St. in Decatur, Proposal A, Morgan Co.;

Ala.—**Deep South Constr. Co.**, Montgomery, Ala., LB **$138,820**, maint. resurf. Proposal 6, 42.924 mi. Lee and Macon Counties. Bids May 18. CD 5/8.

MISSISSIPPI—State Hy. Dpt., T. C. Robbins, dir., Jackson,

S. K. Jones Constr. Co., 819 Sterick Bldg., Memphis, Tenn. LB **$312,523**, est. $330,000. grav. surf. course 15.988 mi., and AH type bridges Miss. Hy. No. 1 between Sherard and Delta Landing, Proj. F052-1 (1), Coahoma Co. Bids May 22. CD 5/14.

MISSISSIPPI—State Hy. Dpt., T. C. Robbins, dir., Jackson,

Miss.—**W. E. Blain & Son**, Mount Olive, Miss. CA **$228,145**, est. $230,000. double bit. surf. tr. 10.019 mi. on Miss. Hy. No. 12 between Hollandale and The Sunflower River, Hy. Proj. F 018-1 (3), Washington Co.;

Miss.—**Midstate Paving Co.**, Lamar Bldg., Meridian, Miss. CA **$90,592**, est. $110,000. double bit. surf. tr. 12.062 mi. Miss. Hy. No. 18 between Quitman and Alabama State Line, Proj. S0349 (5) A, and S.P. 18-6 (1), Clarke Co.;

Miss.—**J. B. Russell, Contractor**, Tchula, Miss. CA **$208,211**, est. $200,000. base double bit. surf. tr. 12.941 mi. Miss. Hy. No. 465 between Brunswick and Vicksburg, Proj. S 0400 (1), A, Issaquena and Warren Counties. Grand total $526,948. Bids May 22. CD 5/14.

LOUISIANA—State Hy. Dpt., Highway Office Bldg., Baton Rouge,

Flenniken Constr. Co., 3820 Florence Ave., Shreveport, La. CA **$920,402**. wid'n. 4.424 mi. Lake Charles-Chloe Hy. State Rte. LA-90, S.P. 810-24-28 and 3-04-37, access road Proj. D-RD-4, Calcasieu Parish. CD 4/26, under LB.

BUILDINGS—LB & CA

Sullivan Constr. Co., 1047 Atlantic Blvd., Pompano Beach, Fla., CA, **$960,000**. APARTMENT, Atlantic Blvd., DEERFIELD BEACH, FLA. Cove Realty Co., c/o Robert E. Hanson, 311 S.E. 16 Ave., Ft. Lauderdale, Fla. CD 5/11, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

Mich., Munising—BA 6/13—City, D. R. Potter, clk., c.i. water main, connecting existing main, water pumping station, appurtenances. Plans deposit $10 mains, $10 pump station, refundable. Greeley & Hansen, 220 S. State St., Chicago, Ill., engrs.

† **Wisconsin**—BA About 6/22—U. S. Eng., 1217 U. S. Post Office & Custom House, St. Paul 1, Minn., harbor imprvs., Cornucopia Harbor, Lake Superior, Bayfield Co., CIVENG-21-018-56-75. CD 9/26.

BUILDINGS—BA

Wis., Milwaukee—PLANT—BA 6/12—A. C. Spark Plug Div., General Motors Corp., 1925 E. Kenilworth Ave., 1 story, 338x644 ft., steel, brick, concrete manufacturing plant, Oak Creek. $750,000. Argonaut Realty Div., 485 W. Milwaukee Ave., Detroit, Mich., engr. CD 1/9.

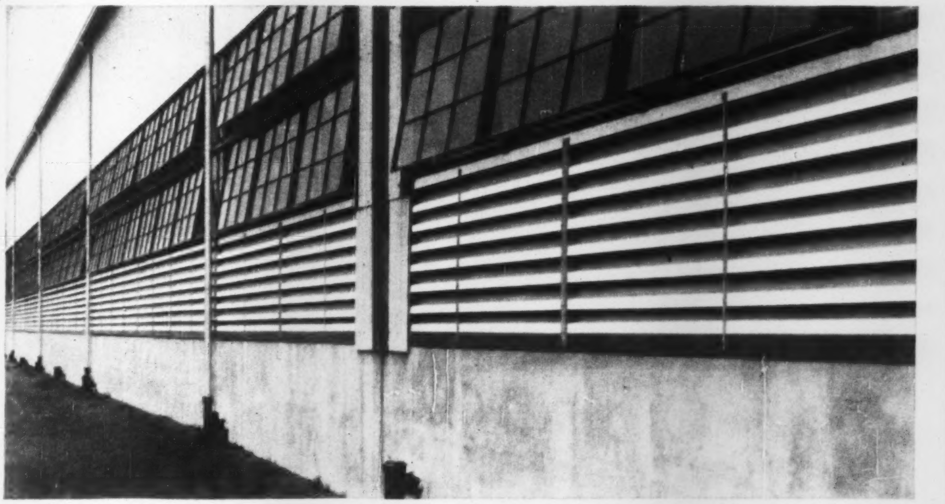
HEAVY CONSTRUCTION—LB & CA

S. A. Ruebel Co., 800 Ross St., St. Bernard, O. CA **$683,034**, est. $820,000. extend concrete roadway from Westwood Northern Blvd., from North Bend to Harrison, two 24-ft. lanes bridge at Race Rd.,

(Continued on page 133)

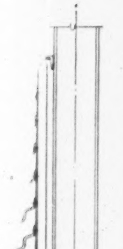
ONE OF A
SERIES OF
IDEAS FOR
YOUR FILES

ANOTHER NEW IDEA...



WITH CORRUGATED ASBESTONE

Walls that breathe with louvers of Gold Bond Corrugated Asbestone



Sidewalls in this Alabama plant ventilate and protect at the same time. Louvers made of fireproof Gold Bond Corrugated ASBESTONE "400" form the lower sections of these unusual sidewalls and add to the general appearance of the plant, too. The diagram at the left illustrates the method used in this system. The upper walls are sided with Corrugated "400" in the traditional straight line method. Rock-like ASBESTONE needs no upkeep . . . resists weather and corrosion permanently.

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Gold Bond Technical Bulletin No. 2032, and Booklet No. 2273 gives full specifications and uses of Gold Bond CORRUGATED ASBESTONE Products.

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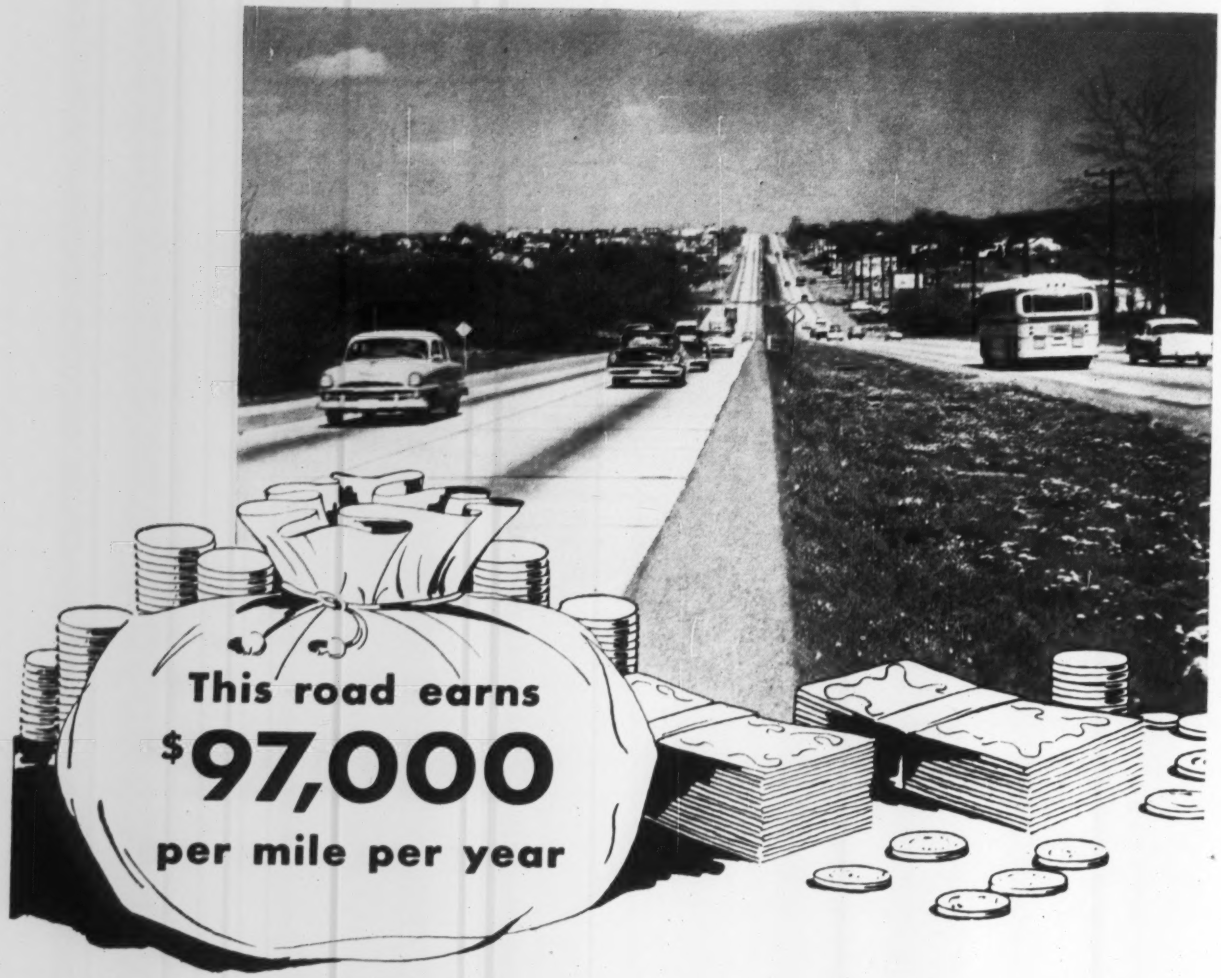

A road earning money? Absolutely! Every road earns money in the form of gas taxes and license fees paid by drivers using it. The more vehicle miles of traffic a road handles the more money it earns.

The road pictured is U.S. 40, northeast of Baltimore. It carries a daily average of 45,000 vehicles, many of them commercial. Here's how the earnings of this concrete road are computed:

Vehicles traveling this road per day	45,000
Times average vehicle tax per mile in Md.	$.00714
Equals earnings per day per mile	$321.30
Times number of days a year	365
Equals annual earnings per mile	$111,275
Minus the annual cost to build and maintain such a road during its lifetime	$20,000
Equals annual profit earned per mile	$97,275

Similar analyses elsewhere show that concrete roads earn the most "profit." That's because they attract the most traffic and have the longest life.

For example, concrete carries the load on 92% of the pavement of the 25 most heavily traveled rural road sections in America. And official studies reveal that concrete has at least twice the life expectancy of the next most commonly built pavement.

Concrete roads usually earn *more* than they cost to build and maintain. The "profit" pays for additional miles of new highways. In contrast, other commonly built pavements have such a relatively short life and require such frequent and expensive maintenance that they earn *less* than they cost to build and maintain. Thus they drain an increasing amount from available funds for maintenance, leaving a decreasing amount for building critically needed new mileage.

Highway users expect engineers and public officials to invest their money in roads paying the best dividends. That means paving all main roads with concrete, the self-supporting, profit-making pavement.

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PORTLAND CEMENT ASSOCIATION **Dept. 6a-17, 33 West Grand Avenue, Chicago 10, Illinois**

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

(Continued from page 130)

CINCINNATI, O. Comrs. Hamilton Co., Court House, Cincinnati, O. Bids May 15, awarded May 22. CD 5/22, under LB.

† **Grohne Co., Inc.,** 2594 N. Water St., Decatur, Ill., LB **$299,124,** fire walls in Building 103, Decatur Signal Depot, Serial No. ENG-11-032-56-57, DECATUR, ILL. U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill. Bids May 3. CD 4/5.

Grange Constr. Co., 2710 E. Norwich Ave., Milwaukee, Wis., CA, **$132,980** (7 bidders) sewers in W. Oklahoma Ave., W. Howard Ave. and S. 20 and S. 18 Sts., MILWAUKEE, WIS. City, City Hall, Milwaukee, Wis. Bids May 14, awarded May 22. CD 5/9.

MICHIGAN—State Hy. Dpt., Dir. Purchases, 107 Lewis Cass Bldg., Lansing,

Bethlehem Steel Co., Bethlehem, Pa. CA **$321,429.** BUI B69 of 82-22-10 C1UO 6-1-57, UI 391 (61), Wayne Co. Bids Apr. 26. CD 4/20.

BUILDINGS—LB & CA

▲ **Baker & Coombs, Inc.,** 601 E. Brockway Ave., Morgantown, W. Va., CA **$1,363,000,** DORMITORY No. 11, ATHENS, O. Ohio University Athens O. Bids May 8, awarded May 23. CD 5/16, under LB.

Brockman & Peters, c/o Hamco Realty, 7765 Coleraon Park, Cincinnati, O. Own Forces. **$693,000,** 33 one story brick, bsmnt. HOMES, off Colerain, near Bryneside Dr. CINCINNATI, O. James Wald & Assoc., 2565 Galbraith Rd., Cincinnati, O., engr. Awarded May 22.

▲ **Joseph Skilken,** 383 S. 3 St., Columbus, O. CA **$2,500,000.** 51 brick, steel stores, SHOPPING CENTER, 3897 S. High St., COLUMBUS, O. Great Southern Shoppers City, Inc., Don Castro & Assocs., 42 S. 4 St., Columbus, O

▲ **M. W. Kellogg Co.,** 711 3 Ave., New York 17, N. Y. CA Est. **$35,000,000-$40,000,000,** design and construct, REFINERY addns., TOLEDO O. Standard Oil Co. of Ohio, Midland Bldg., Cleveland, O. CD 3/19.

Jezo Constr. Co., 1909 S. 74 St., West Allis, Wis., LB **$675,000** (4 bidders) general contract ELEMENTARY SCHOOL, WEST ALLIS, WIS. Bd. Educ., 7510 W. National Ave., West Allis, Wis. Bids May 21. CD 4/23.

▲ **Kusehell Corp.,** 5227 E. 7 Mile Rd., Detroit, Mich. Owner Builds. **$2,000,000.** Green Bay Subdivision, 52 HOMES, Green and Flanders Lakes, BLOOMFIELD, MICH.

▲ **Darin & Armstrong, Inc.,** 2041 Fenkel St., Detroit, Mich. LB **$2,096,000.** Oak Park SCHOOL addn. No. 3, OAK PARK, MICH. Bd. Educ., Dist. No. 3, Royal Oak-Southfield Twp., Oak Park, Mich. Bids May 3. CD **4/16.**

▲ **Joseph Jaffa & Sons,** 19987 James Couzens Hy., Detroit, Mich. CA Est. **$1,800,000.** Bridge Meadows Development Proj. No. 5, 125 brick HOMES, Middle Dr. and West Rd., TRENTON, MICH. Jaffa Realty Co., 2289 National Bank Bldg., Detroit 26, Mich.

▲ **Wake-Pratt Constr. Co.,** 1528 S. Main St., Royal Oak, Mich. Owner Builds. **$1,700,000.** Buckingham Acres, 122 brick HOMES, 14 Mile Rd. between Rochester and Stephenson Sts., TROY, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

† **COLORADO**—BA 6/12—Bureau P. Rds., Dpt. Commerce, Bldg. 40, Denver Federal Center, Denver,

Custer Co.—constr. 3.314 mi. Forest Hy. 35-1, Greenhorn Highway. **$460,000.** K. S. Chamberlain, div. engr. CD 4/5.

▲† **Missouri-Arkansas**—BA 6/21—U. S. Eng., P.O. Box 867, Little Rock, Ark., state hy. 13 relocation (8,000 ft.) grading, drainage, crushed stone base, double seal coat, Table Rock Reservoir, CIVENG-03-050-56-43, $1,000,000-$3,000,000. CD 5/18.

† **Missouri-Arkansas**—BA 6/21—U. S. Eng., P.O. Box 867, Little Rock, Ark., relocation of bridge 1,860 ft. on State Hy. 13, Table Rock Reservoir, CIVENG-03-050-56-44. CD 5/18.

† **N. M., Roswell**—STORAGE ORDNANCE BASE—BA 6/21— U. S. Eng., Box 1538, Albuquerque, storage ordnance base, Walker Air Force Base, ENG-29-005-56-48, $210,000. CD 5/21.

Ia., Odebolt—BA 6/25—City, sewage plant and outfall sewer, $105,000. Henningson, Durham & Richardson, 2962 Harney St., Omaha, Neb., consult. engrs. CD 3/16/50.

† **N. M. Roswell**—NCO CLUB—BA 6/22—U. S. Eng., Box 1538 Albuquerque, NCO club, $350,000. CD 5/22.

† **Missouri**—BA 6/28—U. S. Eng., 420 Locust St., St. Louis, Zone 2, constr. floodwall and closure structure, Cape Girardeau Flood Protection Proj. Items III and IV, Cape Girardeau, CIVENG-23-065-56-88. CD 11/7.

BUILDINGS—BA

▲ **Colo., Fort Collins**—ENGINEERING, etc.—BA 6/22—Colorado A & M College, Fort Collins, five 3 story engineering and physics center buildings, $1,625,000. James M. Hunter, 1126 Spruce St., Boulder, archts. Ib Falk Jorgensen, 924 Broadway, Denver, engr. CD 12/2.

† **Kan., Salina**—TRAINING CENTER—BA On Or About 6/22— U. S. Eng., 1800 Federal Office Bldg., 911 Walnut St., Kansas City 6, Mo., U. S. Army Reserve Training Center, ENG-23-028-56-86.

HEAVY CONSTRUCTION—LB & CA

† **G. I. Johnson & Son Co.,** 848 W. 79 St., Minneapolis, Minn. LB $300,531. Alt. A (2 bidders) GAR-1

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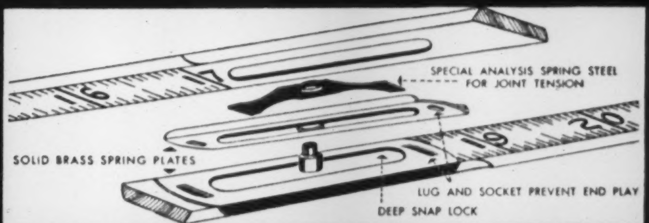
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SPECIAL ANALYSIS SPRING STEEL FOR JOINT TENSION
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6" brass slide for inside measurements. 50% heavier wood for extra heavy duty.

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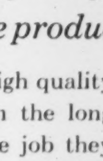

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even on
steep
inclines,
even
when wet

THINK—where can you use this new supersafe Alcoa® AbrasiveTread Plate? It's made from a tough aluminum alloy with a skid-proof aluminum oxide rolled right into the surface. Alcoa Abrasive Tread Plate is so nonskid you can walk right up a 30° incline—even when it's wet. In fact, even oil does not lessen the skid resistance of Alcoa Abrasive Tread Plate.

Alcoa Abrasive Tread Plate is ⅓ the weight of steel. It won't stain, and it resists corrosion. It's easy to fabricate—cut, punch, form, weld, shear, etc. It comes in a wide range of thicknesses and sizes.

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Alcoa Abrasive Tread Plate is ideal for engine room floors, ladder treads, conveyor lines, catwalks, ramps, walkways in trains, aircraft, trailers, and many other uses. See your Alcoa distributor.

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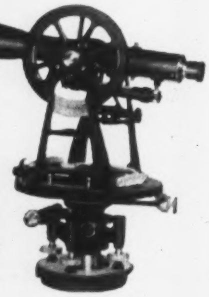


bulk storage bldg. officers' club addn., AIL storage shed, etc., Duluth Air Force Base, DULUTH, MINN. U. S. Eng., 1217 Post Office and Custom House, St. Paul, Minn. Bids May 22. CD 5/9.

SOUTH DAKOTA—State Hy. Dpt., Pierre,

S. D.—**J. F. England's Sons, Inc.**, Rapid City, S. D. and **Lawrence Steele & Son**, Belle Fourche, S. D., CA **$134,906** (5 bidders) bridges and box culverts, SAP 306 (St. Wk.) Butte Co.;

S. D.—**Sweetman Constr. Co.**, 100 S. Dakota St., Sioux Falls, S. D., CA **$97,394** (6 bidders) one 426 ft. composite I-beam viaduct, S 374 (4), Yankton Co. Bids May 22. CD 5/9.

▲ **SOUTH DAKOTA**—State Hy. Dpt., Pierre,

S. D.—**Wilbur Christensen Constr. Co.**, Ringsted, Iowa, CA **$189,645** (9 bidders) grading, sub-base, etc. 9.919 mi. SAP 306 (St. Wk.) Butte Co.;

S. D.—**S. E. Gustafson Constr. Co., Inc.**, W. 12 St., Sioux Falls, S. D., CA **$124,111** (9 bidders) grading, etc. 18.125 mi. F 464 (1), Spink Co.;

S. D.—**J. L. Healy Constr. Co.**, 301 Western Surety Bldg., Sioux Falls, S. D., CA **$98,897** (5 bidders) base course, bit. surf. 5.407 mi. S 389 (3), Turner Co.; CA **$78,103** (3 bidders) base course, bit. surf. 4.04 mi. S 14 (5), Minnehaha Co.; CA **$373,599** (6 bidders) bit. surf. (retread type) 20.971 mi. F 158 (9) (St. Wk.) Clay Co.;

S. D.—**C. H. Lien Constr. Co.**, 8 and St. Anne Sts., Rapid City, S. D., CA **$306,224** (10 bidders) base course imprvt. and bit. surf. 14.683 mi. F 206 (12), Butte Co.; CA **$305,415** (9 bidders) bit. surf. (retread type) 18.847 mi. FAP's 46 (pt.), 195A, 249A and 252 (St. Wk.) Hamlin Co.;

S. D.—**G. H. Lindekugel & Sons**, Mitchell, S. D. CA **$435,457** (6 bidders) bit. surf. retread type, 25.308 mi. FAP's 26, 25 and 170A (pt.) (St. Wk.), Kingsbury and Brookings Counties;

S. D.—**Missouri Basin Constr. Co.**, Mitchell, S. D., CA **$75,192** (2 bidders) base course, bit. surf. 2.515 mi. SAP 272 (St. Wk.) and F 473 (2) approaches, Bon Homme Co.;

S. D.—**Pasco Constr. Co.**, Sioux Falls, S. D., CA **$497,494** (6 bidders) grading, sub-base, etc. 11.508 mi. F 157 (3), Mellette Co.;

S. D.—**Dean R. Rounds**, 1110 W. Main St., Rapid City, S. D., CA **$233,687** (8 bidders) bit. surf. (retread type) 11.8 mi. F 123 (6) and F 163 (7), (St. Wk.) Butte and Lawrence Counties;

S. D.—**A. W. Schnuerle**, Hy. 281 S., Aberdeen, S. D., CA **$486,348** (9 bidders) bit. surf. (retread type) 26.954 mi. FAP's 34 and 94 (St. Wk.), Spink Co.;

S. D.—**Summit Constr. Co.**, 728 St. Anne St., Rapid City, S. D., CA **$194,830** (8 bidders) bit. surf., retread type 13.701 mi. FAP 8 (St. Wk.), Butte Co.;

S. D.—**Western Contg. Corp.**, 400 Benson Bldg., Sioux City, Iowa, CA **$1,397,395** (5 bidders) c. conc., etc. 13.825 mi. F 473 (2), Bon Homme Co. Grand total $4,796,397. Bids May 22. CD 5/9.

TEXAS—State Hy. Comn., Austin,

rejected bids May 15, St. L. & S.W. underpass and approaches 1.248 mi. Hy. US 175 and St. 31, Proj. UF 575 (9), etc., Henderson Co. LB **$511,238**. CD 5/21, under LB.

▲ **TEXAS**—State Hy. Comn., Austin,

Tex.—**Austin Bridge Co.**, P.O. Box 1590, Dallas, Tex. CA **$613,922**, grade separation, storm sewers, roadbed tr. 0.978 mi. Hy. US 77. Proj. IN 230, Denton Co.;

Tex.—**Ivan Dement**, P.O. Box 1787, Amarillo, Tex. CA **$603,909**. P & SF underpass and approach, pavement widen 2.442 mi. Hy. ST 51. Proj. C 226-5-11, etc., Deaf Smith Co. Bids May 16, awarded May 22. CD 5/21, under LB.

Peter Kiewit Sons' Co., Box 8787, University Park Station, Denver, Colo. CA, **$171,699**, est. $211,800 Street Imprvt. Dist. 1023, concrete curbs, gutters, sidewalks, grav. base courses, b. conc. paving, DENVER, COLO. City and Denver Co., City & County Bldg., Denver, Colo. Bids May 16, awarded May 19. CD 5/16.

BUILDINGS—LB & CA

Midwest Developers, Inc., 1254 Baker Bldg., Minneapolis, Minn. Owner Builds. **$700,000**. SHOPPING CENTER, incl. 17 stores, grading of site, AURORA, MINN. H. W. Fridlund, 6009 Wayzata Blvd., Minneapolis, Minn., archt.

Metropolitan Constr. Co., 306 Armour Rd., North Kansas City, Mo. CA Approx. **$750,000**. 3 story, brick 30,000 sq. ft. DOCTORS' OFFICE and parking lot, 63 St. and Rockhill Rd., KANSAS CITY, MO. Parkway Investment Co., 1018 Commerce Bldg., Kansas City, Mo. McLain & Sidorwicz, 721 Minnesota Ave., Kansas City, Kan., archt. Awarded May 21.

A. C. Samford, Inc., Slappey Dr., Albany, Ga. CA Est. **$300,000**. 140x440 ft., plant food FACTORY, 40x57 ft. OFFICE, ST. JOSEPH, MO. Swift & Co., Union Stock Yards, Chicago, Ill.

R. G. Martin Constr. Co., 1131 N. Mosley St., Wichita, Kan. Owner Builds. **$150,000**. WAREHOUSE, WICHITA, KAN. M. H. Beckman, 1552 Yale Blvd., Wichita, Kan., archt. Wichita Paper Co., lessee.

▲ **Arlington Heights West, Inc.**, 200 Houston St., Fort Worth, Tex. Own Forces. **$360,125**, 25 DWELLINGS; **$389,910**, 31 DWELLINGS; **$378,100**, 30 DWELLINGS. ARLINGTON, TEX. Grand total $1,128,135. CD 5/16.

Brown Development Co., Odessa, Tex. Own Forces. **$346,500**, 28 DWELLINGS; **$407,275**, 33 DWELLINGS, in Sherwood Addn., ODESSA, TEX. CD 5/23.

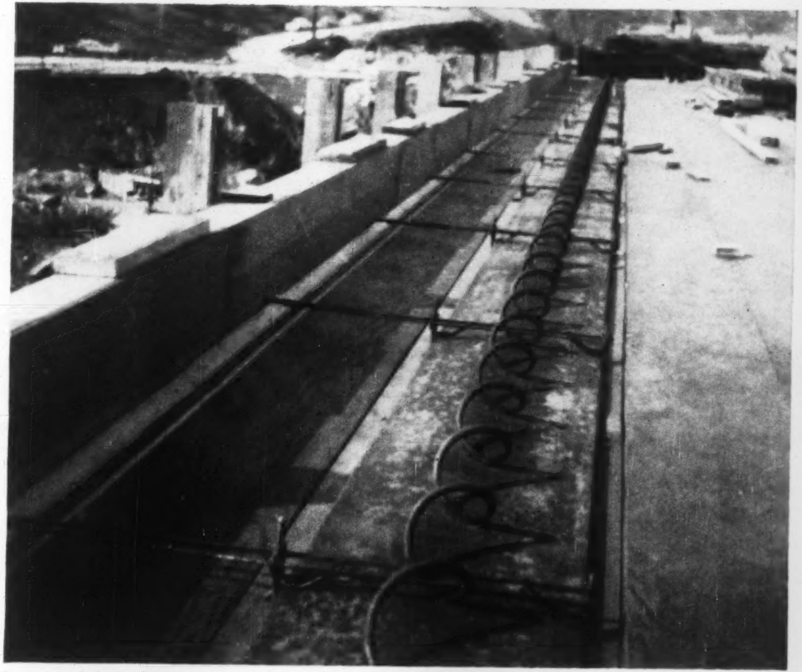
FAR WEST

HEAVY CONSTRUCTION—BA

† **California** — BA [illegible]/15 — U. S. Eng., 1209 8 St., Sacramento, stone protection, along right and left banks of San Joaquin River from head of Old River

(Continued on page 137)

(Advertisement)



Support of these slab forms was quickly and easily accomplished from above with the Richmond Free Fit Hanger Frame-Ty. (Bridge above Ardsley over Saw Mill River Parkway—part of New York State Thruway construction; Raylin Construction Corp. and The Lynn Corporation, general contractors.)

Study of Slab Form Support Shows Savings with Richmond System

By what standards do contractors measure the effectiveness of flat slab form support methods? Which support systems are proving most helpful?

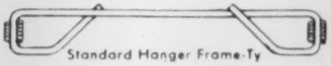
A survey brought out the following facts: *experienced contractors measure the effectiveness of flat slab form support systems in terms of [illegible] things: the degree of speed, [illegible] economy which they bring to [illegible].*

[illegible] is no longer used extensively because it meets none of the above three requirements. The use of wire beam saddles also is becoming less common. Although prefabricated to size, they are non-adjustable, and there is no positive means of tightening against the steel to prevent leakage of concrete.

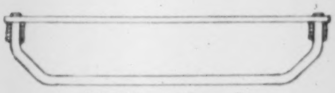
Posting or "horses" are still used but this method is comparable to bracing wall forms. Prefabrication costs are high and erection is slow because of wedging and nailing usually required at the bottom flange of the beam. On high structures and deep beams this procedure is dangerous because the men have to reach down to the bottom flange to make the final tightening adjustment.

Richmond Hanger Frame-Tys are ideally suited to hang this type of construction. These units in Standard, Free Fit or Offset types (see illustrations) can all be adjusted for various slab heights and haunch conditions. Their established safe working loads enable the contractor to take full advantage of lumber strength and hanger capacity.

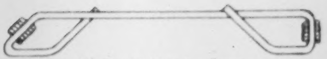
Richmond Standard and Offset Hanger Frame-Tys can be erected with a minimum of reaching under the *top* flange of the beams. Richmond Free Fit Hanger Frame-Tys have an additional advantage: all tightening is done from the top of the hanger by means of the nuts (see circle in large illustration), the Tylag passing freely thru an oversized coil.



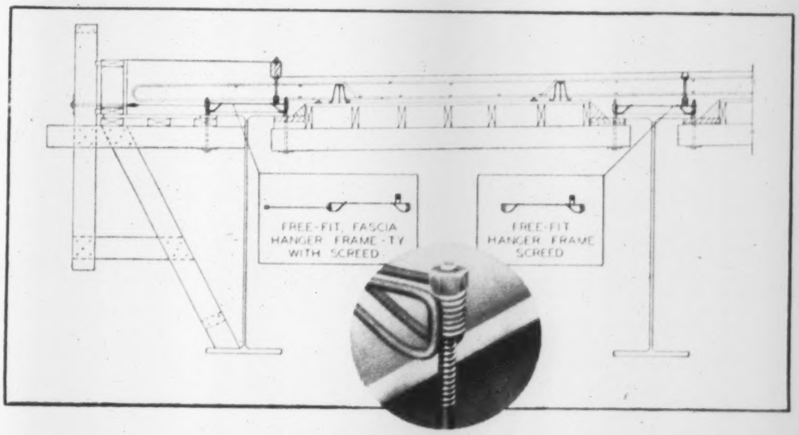
Standard Hanger Frame-Ty



Offset Hanger Frame-Ty



45° Fascia Hanger Frame



FREE-FIT, FASCIA HANGER FRAME-TY WITH SCREED
FREE-FIT HANGER FRAME SCREED

Dual uses of these Richmond Hangers have become standard: Fascia Hanger Frame-Tys used not only to hang the forms but also tie in the Fascia Ty; a variation of this is the 45° Fascia Hanger Frame for light overhang, where one 45° bolt supports the fascia overhang and hangs the form; Hanger Frame Screeds combine support of the deck forms with an adjustable base for screeding or supporting curb forms.

Richmond Hanger Systems have reduced the contractor's overhead in time and materials, added safety to his operation and improved the quality of his work. The various types of Richmond Hanger Systems and their applications are detailed in tne **1956** Richmond Catalogue. Write for your copy. Or, if you have specific concreting problems, Richmond's Technical Division or field men will be glad to advise you.

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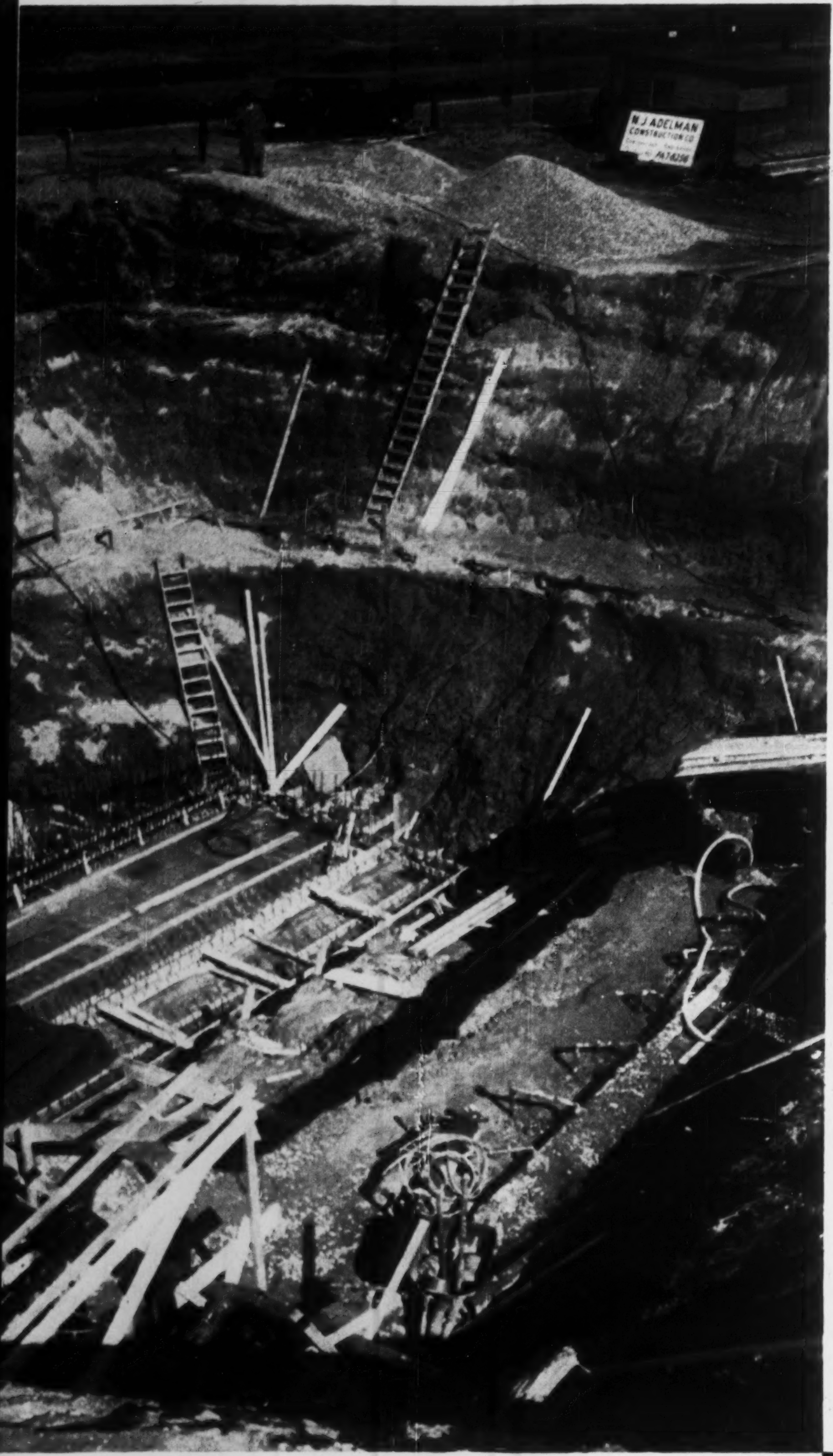

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Western Representative: Andrews Machinery of Washington, Inc., Seattle 4, Washington

Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

MORETRENCH CORPORATION

(Continued from page 134)

to Brandt Bridge, San Joaquin Co., CIVENG-56-135, $500,000. CD 1/20/45.

† **Wash., Richland**—BA 6/25—Atomic Energy Comn., 703 Building, Richland, acid feed and filter sampling facilities for existing water treatment plants in 6 Hanford Works production areas. CD 6/30/52, under Public Buildings.

BUILDINGS—BA

Wash., Everett—OFFICE—BA 6/26—Snohomish Co Public Utility Dist., 3030 Colby Ave., 2 story, bsmnt., 62x181 ft., rein.-con office, rein.-con. fdn. $650,000. W. A. Johnson & Assocs., 3506 Broadway, archts CD 2/11/53.

BUILDINGS—SLC

▲ **Ore., Medford**—HOSPITAL—Medford Hospital Assn., Medford, soon lets contract hospital. $1,000,000 Rogers & Butler, 219 E. 44 St., New York, N. Y., archts. Harvey & Watkins, Medford, Ore., engrs. CD 2/7/55.

HEAVY CONSTRUCTION—LB & CA

† **Fonesdeck Constr. Co.**, Idaho Falls, Idaho, LB **$115,417**, completion work for group of 4 wells, Mindioka Proj., Spec. 100C-243, IDAHO. Bureau Reclamation, Dpt. Interior, Rupert, Idaho. Bids May 17. CD 4/19.

WASHINGTON—State Hy. Comn., Olympia,

McCray Marine Constr. Co., 2370 Fairview Ave. N., Seattle, Wash., CA, **$112,400**. removing old Chehalis River Bridge on Primary State Hy. 13, Aberdeen, Grays Harbor Co. Bids May 22. CD 5/11.

Harbert Constr. Co., Box 1369, Birmingham, Ala., LB **$533,851**, (10 bidders) 44 mi. 1- to 8-in. wrapped steel pipe line for natural gas distr. sys., ELLENSBURG, WASH. City, City Hall, Ellensburg, Wash. Bids May 21. CD 4/25.

† **Northwood, Inc.**, Equitable Bldg., Portland, Ore., CA **$571,636**. diversion tunnel at Cougar Reservoir Dam site on South Fork McKenzie River, approx. 7 mi. upstream from city of Blue River, Lane Co., CIVENG-35-026-56-178, OREGON. U. S. Eng., Pittock Block, Portland, Ore. Bids May 16, awarded May 21. CD 5/23, under LB.

† **OREGON**—Bureau P. Rds., Dpt. Commerce, Morgan Bldg., Portland,

Rogers Constr. Co., 11760 N.E. Glisan St., Portland, Ore., CA **$454,085**, (6 bidders) reconstr. 8.618 mi. John Day-Burns Hy., Harney Co. Bids May 11. CD 5/1.

† **W. L. Ridge Co.**, S. 428 Greene St., Spokane, Wash. LB **$201,719**, (5 bidders) Schedule I, Big Eddy-Parkdale sect. of Big Eddy-Oregon City 287 kv line, 23 mi. Wasco and Hood River Counties, Inv. 7971, OREGON. Bonneville Power Admin., 1001 N.E. Lloyd Blvd., Portland, Ore. Bids May 21. CD 4/26.

† **Blount Bros. Constr. Co.**, 816 W. 5 St., Los Angeles, Calif., LB **$942,084**, (4 bidders) third Nike installation, Travis Air Force Base, ENG-56-57, CALIFORNIA. U. S. Eng., 1209 8 St., Sacramento, Calif. Bids May 23. CD 5/3.

▲ **Utah Constr. Co.**, 100 Bush St., San Francisco, LB **$3,734,500** and **$4,136,480** base bid and alternate bid (4 bidders) hydraulic dredging of 14,000,000 cu. yd. sand from San Francisco Bay and reclaiming with same an area 1 mi. out in bay for new Oakland International Airport Terminal Bldg., 8,600 ft. runway, OAKLAND, CALIF. Port of Oakland, foot of Grove St., Oakland, Calif. Bids May 7. CD 3/19.

† **Rogers Constr. Co.**, 3669 California St., San Diego, Calif., LB **$199,700**. oxygen and carbon dioxide bldg., Naval Air Station, North Island, Spec. 49471, SAN DIEGO, CALIF. Eleventh Naval Dist., San Diego, Calif. Bids Apr. 25. CD 10/11.

BUILDINGS—LB & CA

George & M. E. Irwin, Canby, Ore., LB **$967,367**, (6 bidders) JUNIOR HIGH SCHOOL, CORVALLIS, ORE. Corvallis School Dist., Corvallis, Ore. Bids May 15. CD 4/24.

▲ **Henry M. Mason Co.**, 2206 N.W. Thurman St., Portland, Ore., CA Est. **$1,000,000**. 115,000 sq. ft. CLOTHING FACTORY, PORTLAND, ORE. White Stag Mfg. Co., 67 W. Burnside St., Portland, Ore. Bids May 18, awarded May 21. CD 4/19.

▲ **Hilp & Rhodes**, 299 Kansas St., San Francisco, Calif., CA, **$12,000,000**, 4 PLANTS, 260,000 sq. ft. with tilt-up concrete walls on concrete floor slabs at Missile Systems Division, SUNNYVALE, CALIF. Lockheed Aircraft Corp., 1705 Victory Blvd., Burbank, Calif. Paul Huston, 663 Cowper St., Palo Alto, Calif., archt. Hall, Pregnoff & Matheu, 251 Kearny St., San Francisco 8, Calif., engrs. CD 2/15.

CANADA

HEAVY CONSTRUCTION—LB & CA

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto,

Barnett-McQueen Co. Ltd., 450 Christian St., Box 39, Fort William, Ont., CA, **$608,514**. Contract 56-20, new bridge (structural steel not included) on Hy. 17, Trans-Canada Hy. over Little Pic River, Fort William. Awarded May 22. CD 5/25, under LB.

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto,

McNamara Constr. Co. Ltd., 42 Industrial St., Toronto, Ont., CA, **$566,055**. Contract 56-24, gran. base, hot mix paving along 6.71 mi. Hy. No. 2 from Moulinette west, Moulinette. Bids May 16, awarded May 22. CD 5/25, under LB.

Grant Contg. Co. Ltd., 26 Queen St. E., Toronto, Ont., LB **$396,900**, 36 in. water mains from Scarborough filtration plant to Midland and St. Clair Aves., TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. CD 2/8/54.

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Carter Constr. Co. Ltd., 410 Cherry St., Toronto, Ont., LB **$219,649** (2 bidders) subway under railway line, part of Eglinton Ave. E. Extension, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. CD 6/20/52, under Streets & Roads.

BUILDINGS—LB & CA

▲ **Foundation Co. of Canada Ltd.**, 1220 Bay St. Toronto, Ont., CA, Total Est. **$22,000,000** (equipped). MILL EXPANSION, incl. shipping room, steam generator, newsprint machine, FORT WILLIAM, ONT. Abitibi Power & Paper Co. Ltd., Mission Hill, Fort William, Ont. Awarded May 17. CD 4/18.

Dell Constr. Co. Ltd., 2461 Bloor St. W. Toronto, Ont., LB **$726,041** (7 bidders) eight 16-suites each, 2 story, 45x100 ft., concrete block, brick HOME FOR THE AGED buildings, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Bids May 18. CD 5/9.

▲ **F. H. McGraw Co. of Canada Ltd.**, 128 Elmslie Ave., Montreal, Que., CA, **$7,700,000** (4 bidders) MILL and DRYER BLDG., at asbestos mine development, BLACK LAKE, QUE. Lake Asbestos of Quebec Ltd., Black Lake, Que. Bids Mar. 30, awarded May 22. CD 3/20.

▲ **McNamara Constr. Co.**, 62 Industrial St., Leaside, Ont., CA **$7,000,000-$8,000,000**. URANIUM ORE MILL, main bldg., acid plant, power house, chemical storage and tanks, BEAVERLODGE, SASK. Eorado Uranium Mines Ltd., 1750 Yonge St., Toronto, Ont. CD 4/18.

PROPOSED PROJECTS

WATER SUPPLY

▲ **S. D., Rapid City**—City, plans by L. A. Daly Co., Arch.-Engr., Insurance Bldg., Omaha, Neb., water system. **$2,500,000**. CD 3/6.

W. Va., Martinsburg—Berkeley County Pub. Service Dist. WW sys., incl. 9 mi. 12 in. distr. mains, 4/5 mi. smaller mains, filtration plant, pumping station and two 200,000 gal. storage tanks. **$585,000**.

SEWERS, WASTE DISPOSAL

▲ **Ala., Tuscaloosa**—City, City Hall, sewage collection sys. addns., sewage treatment plant. **$3,100,000**.

Calif., Cypress—Cypress County Water Dist., 5202 E. Lincoln Ave., install sanitary sewers, Dist. No. 1, **$529,660**. Boyle Eng Co., Spurgeon Bldg., Santa Ana, consult. engr.

▲ **Calif., Los Altos**—City, c/o Clerk, City Hall, complete sewerage sys. **$1,000,000**. Brown & Caldwell, 66 Mint St., San Francisco, consult. engrs.

Mich., Pontiac—Burton Twp., c/o Johnson & Anderson, engrs., 1307 Pontiac State Bank, Pontiac, 8- to 12-in. sanitary sewers, Burton. **$500,000**.

Mo., St. Louis County—Metropolitan St. Louis Sewer Dist., William Q. Kehr, exec. dir., 506 Olive St., St. Louis, Zone 1, constr. sys. of trunk and sub-trunk sewers to serve Creve Coeur and Frontenac Area of some 10 square mi. bounded by Clayton and Olive St. Rds., Lindbergh Blvd. and metropolitan district limits on west, 3 mi. west of Lindbergh **$675,000**. CD 8/14/44.

N. J., Burlington—City, City Hall, secondary treatment plant (sewage), **$600,000**. Sherman, Taylor & Sleeper, 501 Cooper St., Camden, engrs. CD 8/8/50.

BRIDGES

▲ **Ind., Indianapolis**—Marion Co., County Courthouse, steel, concrete bridge at intersection of Rd 52 and Indianapolis W. 38 St., near here, **$1,500,000**. CD 7/20/44.

Tex., Angleton—Brazoria Co., bond election June 16, vehicle bridge, San Bernard River Crossing, between Hinkles Ferry and Churchill Bridge, **$500,000**, vehicle bridge, Blacks Ferry, San Bernard River, **$200,000**. W. J. Lewis, c/o owner, engr. CD 5/10.

STREETS AND ROADS

▲ **CALIFORNIA**—State Div. Hys., 1120 N. St., Sacramento,

Glenn Co.—imprv. drainage between 0.2 mi. south of Orland and near north city limit of Orland, 1.1 mi. on US 99W, **$75,000**, Bids in 1 month.

Siskiyou Co.—surf., structures 3.5 mi. State Rte. 82, incl. bridge across Kidder Creek, bridge across Scott River, **$1,050,000**, Bids in 3 or 4 weeks.

CONNECTICUT—State Hy. Dpt., 165 Capitol Ave., Hartford,

Litchfield Co.—bit. surf. tr. 9.6 mi. Rte 7, from Conn 63 to Conn 124, Canaan and North Canaan. **$90,000**.

bit. surf. tr. 7.3 mi. Rte 44, from US 7 to Salisbury line in Canaan; from N. Canaan line westerly in Salisbury; from N. Y. State line easterly in Salisbury, **$85,000**.

New Haven Co.—bit. surf. tr. 5.2 mi. Rte. 10, southerly from Conn. 70, Cheshire and Hamden, **$75,000**.

bit. surf. tr. 7.6 mi. Rte. 88 from Conn 67 northerly, Middlebury and Southbury. **$85,000**.

relocation Rte. 8, low level bridges, Rubber Ave. and Prospect St., Naugatuck, **$500,000**. Robert Mitchell, c/o owner, engr.

Ill., River Grove—Village, paving and resurfacing, **$600,000**, Edwin Hancock, 1509 W. Jackson Blvd., Chicago, consult. engr.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Lenawee Co.—constr. four-lane divided hy. relocation US-112 between Clinton and Cambridge Junction, controlled access important crossroads separated, adequate connections with county roads, Clinton-Cambridge-Junction. **$7,500,000**. Carlos Weber, c/o owner, ch. engr.

▲ **N. J., Hackensack**—Bergen Co., Administrative Bldg., wid'n., imprv. Forest Ave. from Rt. 4, Paramus to westwood line, imprv. Schraalenburg Rd. in Haworth, Closter and Harrington Park and imprv. Old Hook Rd., Westwood, Emerson, Closter and Harrington Park, **$1,500,000**. Roscoe McClave, co. engr.

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,

Licking Co.—relocation US 50 as by-pass around Brownsville, 10 mi. long, 4-lanes wide. **$4,500,000**. Elmer S. Barrett & Assocs., Chillicothe, consult. engrs.

▲ **OHIO**—Dpt. Hys., Columbus, Zone 15,

Stark and Summit Counties—four lane divided hy., between Akron and Canton, on Route 8. **$8,000,000**. Michael Baker, Jr., Rochester, Pa., consult. engr.

EARTHWORK, WATERWAYS

▲ **Connecticut**—State Agriculture Dpt., 165 Capitol Ave., Hartford, flood control project, Decker Brook, Mill Brook, Meadow Brook, Dams and dry ponds, catch basins, culverts. Windsor, Hartford Co., **$700,000**; flood control proj. Salmon Brook & Muddy Brook 6 dams, dry ponds, catch basins, culverts in 29½ sq. mi. watershed, East Granby, Granby, New Hartford, Litchfield and Hartford Counties. **$350,000**. Dr. Joseph R. Mocheer, 225 Sisson Ave Hartford, c/o owner, engr.

▲ **Maine**—Central Maine Power Co., 9 Green St., Augusta, installing 4,000 kw generator at Bar Mills Hydro-Electric plant in Saco River and lowering crest of dam, **$1,640,000**. FPC has issued license.

AIRPORTS

▲ **Tex., Dallas**—HYDRANT FUELING SYSTEM—Braniff International Airways & Associated Airlines, c/o Love Field, underground hydrant fueling system. **$1,000,000**.

▲ **W. Va., Huntington**—AIRPORT EXPANSION, etc.—Tri-State Airport Auth. of Huntington, Box 1509, voted $1,225,000 bonds, W. Va.-Tri State Airport expansion and imprvs. about 2 mi. S. of Ceredo and Kenova, **$2,450,000**. Fred R. Palmer, Hines Bldg., 915 5 Ave., consult. engr. CD 2/2/45.

LATIN AMERICA

Mexico, Matamoras—Dpt. P. Wks. & Communications, Mexico City, plans replacement of earthen dam across Rio Grande River below here for irrigation and domestic **$600,000**.

PUBLIC BUILDINGS

▲ **Ala., Opelika**—SCHOOLS—Bd. Educ., City Hall, voted bonds, city high school and elementary school. **$1,250,000**.

▲ **Calif., Bakersfield**—JAIL, etc.—Kern Co., Court House, plans by Wright, Metcalf & Parson, 2323 "E" St., jail, sheriffs facility and garage, in Civic Center, **$2,750,000**. CD 5/17/55.

▲ **Calif., Baldwin Park**—SCHOOL—Baldwin Park School Dist., 3699 N. Holly Ave., plans by Kistner, Wright & Wright, 1125 W. 6th St., Los Angeles, 1 story, frame, stucco, Southwest School, **$525,000**, 1 story, 30,600 sq. ft., frame, stucco, Nubia School, **$525,000**. CD 2/21/55.

Calif., Costa Mesa—SCHOOL—Costa Mesa School Dist., plans by Kistner, Wright & Wright, 1125 W. 6th St., Los Angeles, 1 story, 33,000 sq. ft., frame, stucco, College Area school. **$500,000**. CD 10/12.

Calif., Durham—SCHOOL ADDNS.—Durham Unified School Dist., Durham, defeated bonds May 1, school addns. **$830,000**. Lawrence G. Thomsen, 125 W. 3 St., Chico, archts. CD 3/14.

Calif., Garden Grove—SCHOOL—Garden Grove School Dist. plans by Kistner, Wright & Wright, 1125 W. 6th St., Los Angeles, addns. to Mitchell, Bolsa, Crosby, Clinton Schools, **$600,000**; Project 22, 1 story frame, stucco school bldgs. **$375,000**. CD 4/19.

▲ **Calif., Novato**—SCHOOLS—Novato Unified School Dist., Novato, voted **$750,000** bonds, and application for **$1,550,000** state loan, schools.

▲ **Calif., Palo Alto**—SCHOOLS—Palo Alto City Unified School Dist., P.O. Box 450, Palo Alto, voted bonds May 18, 4 new elementary schools and Junior High School. **$2,000,000**. CD 2/28.

Calif., Pittsburg—CITY HALL, etc.—City, City Hall, plans by Confer & Willis, 366 40 St., Oakland, city hall, police station and jail. **$618,000**. CD 5/10.

▲ **Calif., Pittsburg**—JUNIOR HIGH SCHOOL, etc.—The Unified School Dist., voted **$5,000,000**, bonds, Junior High School, elementary school, elementary school addns.

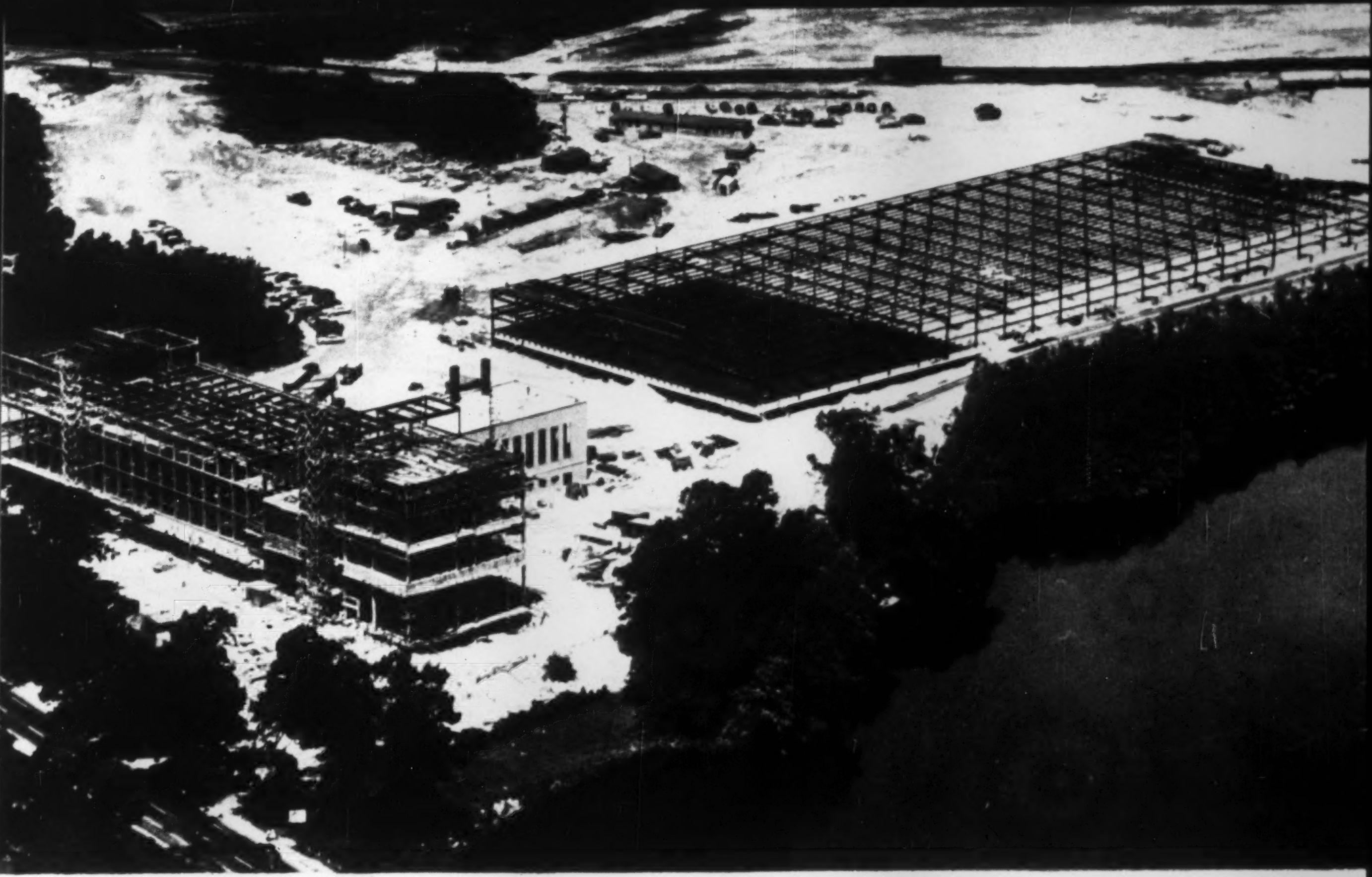
Calif., Rio—SCHOOL—Rio School Dist., plans by Kistner, Wright & Wright, 1125 W. 6th St., Los Angeles, classroom addn. for Primary School 2. **$550,000**.

▲ **Calif., San Mateo**—SCHOOLS—San Mateo Union High School Dist., 650 N. Delaware St., voted $3,030,000 bonds, Mills High School and existing schools addns. **$4,675,000**. CD 2/27.

▲ **Conn., Danbury**—HOUSING—Town Housing Auth., Danbury, plans by Frank A. LaCava, 248 Main St., 3 story, low rent housing, brick with open balconies, 12 to 18 dwelling units each bldg., 150 units, 75 at each location, paved roads, sidewalks, parking area. **$2,000,000**. CD 1/24.

Conn., East Haven—SHOPPING CENTER, etc.—East Haven Redevelopment Comn., Town Hall, public park, public beach, shopping center, 27 acres, Momauguin and Bradford Cove. **$940,000**.

(Continued on page 140)



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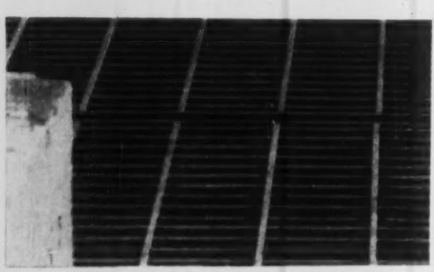

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(Continued from page 138)

▲ **Conn., Hazardville**—PRISON—State Pub. Wks. Dpt., 165 Capitol Ave., Hartford, plans by Sherwood, Mills & Smith, 65 Broad St., Stamford, State Prison, administration bldg., **$16,000,000.** Fred Dubin & Assocs., 1092 Farmington Ave., West Hartford, consult. engrs.

Conn., West Haven—TOWN HALL—Town, 3 story town hall, incl. central police and fire headquarters, site of present structure, Main St. and Campbell Ave. **$500,000.**

Conn., Winsted—HOUSING—State Pub. Wks. Dpt., 165 Capitol Ave., Hartford, 50 unit, moderate rental housing, Florence St. **$605,000.** P. J. Carroll, State Pub. Wks. Dpt., engr.

▲ **Fla., Jacksonville**—CITY HALL—City, City Hall, plans by Reynolds, Smith & Hills, 227 Park St., 15 story, city hall. **$6,000,000.** CD 5/2/46.

▲ **Idaho, Meridian**—SCHOOL—Meridian School Dist. No 2, Ada and Canyon Counties, Meridian, bond election June 7, 5 grade schools, High School and Junior High School addn. **$1,450,000.** CD 5/15.

▲ **Ill., Chicago**—COURT HOUSE—Bd. Comrs. Cook Co., 519 County Bldg., plans by Richard Prendergast, 30 N. Dearborn St., court house. **$24,000,000.**

▲ **Ill., Chicago**—HOSPITAL—Bd. Comrs. Cook Co., 519 County Bldg., plans by Richard Prendergast, 30 N. Dearborn St., men's hospital bldg. addn. **$10,000,000.** CD 4/28/52.

▲ **Ill., Orland Park**—SCHOOL—Carl Sandburg High School, 133rd St. & Rt. 45, plans by Ganster & Henninghausen, 222 Washington St., Waukegan, high school addn. **$1,000,000.**

Ill., Woodstock—HOSPITAL—Woodstock Memorial Pub Hospital, 228 N. Main St., plans by Ganster & Henninghausen, 222 Washington, Waukegan, 3 story, bsmnt., brick, rein.-con. hospital addn. **$750,000.** CD 8/18/50.

▲ **Ind., Bloomington**—RESIDENCE HALL, etc.—Indiana University, Bloomington, plans by Eggers & Higgins, 100 E. 42 St., New York 17, N. Y., residence hall for men and women, **$4,000,000,** CD 12/16/55; rare book library, **$500,000;** stadium, **$5,000,000;** humanities and social science bldg., **$5,000,000.** A. M. Strauss, 600 Strauss Bldg., Ft. Wayne, Zone 2, assoc. arch. on humanities bldg. only.

Ind., Portland—HIGH SCHOOL— Bd. Educ., Portland-Wayne Twp., Mrs. Hugh N. Ronald, pres., School, Portland, high school and 3,000 seat gym adjacent to present bldg. **$850,000-$900,000.**

▲ **Iowa., Oskaloosa**—SCHOOL—Bd. Educ., voted **$1,050,000** bonds May 1, high school, Webster Grade School and room addn., to two grade school. CD 4/12.

Iowa, Perry—SCHOOL—Bd. Educ., William Bolt, supt. Schools, defeated **$627,000** bonds, high school. CD 4/16.

▲ **Kan., Altamant**—SCHOOL—Bd. Educ., Herwan Harrison, Supt. Schools, voted **$1,400,000** bonds May 11, 2 story brick, stone, steel high school, auditorium, gymnasium and classroom-vocational bldg., Frangkiser & Hutchens, 7926 State Line, Kansas City, Mo., archts. CD 4/23.

† **Kan., Great Bend**—POST OFFICE—General Services Admin., Pub. Bldgs. Service, 2306 E. Bannister Rd., Kansas City 14, Mo., post office on lease-purchase plan. **$670,000.**

Ky., Melbourne—INFIRMARY—St. Ann Convent Mary, Inglis Hy., infirmary, 3 story, bsmnt., chapel. **$800,000.** Howard & Thomas McClorey, Woodburn Ave., Cincinnati, O., archts. and consult. engrs.

▲ **Md., Baltimore**—INFIRMARY—City, Bureau Bldg. Constr., 404 Municipal Bldg., Zone 2, plans by Lucius R. White Jr., 1009 N. Calvert St., Zone 2, masonry, concrete, steel infirmary East Wing addn., alterations. **$1,500,000.** Van R. P. Saxe, 1701 St. Paul St., Zone 2, struct. engr. Egli & Gompf, 1019 N. Calvert St., Zone 2, mech. engrs. R. E. L. Williams, bldg. constr. engr. CD 5/10/55.

▲ **Md., Baltimore**—SCHOOLS—City, Bureau Bldg. Constr., 410 Municipal Bldg., Zone 2, plans by C. H. Hebrank, 2111 N. Charles St., Zone 18, Oriole Park Elementary School, **$500,000;** plans by Taylor & Fisher, 13 W. Hamilton St., Zone 1, Mt. Royal Elementary School, **$500,000;** plans by Cochran, Stevenson & Wing, 925 N. Charles St., Zone 1, Edgewood Elementary School, **$550,000;** plans by Meyer & Ayers, 2315 St. Paul St., Zone 18, Cherry Hill Elementary School, **$450,000;** Frankford Elementary School, **$400,000.** R. E. L. Williams, bldg. constr. engr. CD 11/9/54.

▲ **Mass., Boston**—PARKING GARAGE—City, City Hall, 5 story, 22,000 sq. ft. parking garage to be built on top of Central Artery Tunnel bounded by Dewey Square (South Station), Atlantic Ave. and Purchase St. **$1,500,000. To go ahead in 2 years. CD 1/5/51.**

▲ **Mich., Jackson**—SCHOOL—City, Union School Dist., defeated **$10,600,000** bonds May 15, school program. CD 4/6.

▲ **Minn., Austin**—SCHOOL—Bd. Educ., S. L. Coumbe, clk., voted $4,400,000 bonds May 15, high school, **$2,000,000;** high school, **$600,000;** grade school and 3 smaller schools. Hammel & Green, 1392½ University Ave., St. Paul, archts. CD 4/20.

Minn., Mahtomedi—SCHOOL—Bd. Educ., T. Newcomb, clk., voted **$530,000** bonds May 15, grade school addn., high school addn. Hammel & Green, 1932½ University Ave., St. Paul, archts.

▲ **Minn., Moorhead**—SCHOOL—Bd. Educ., Clay County School Dist. No. 122, J. Swanson, supt., voted **$2,500,000** bonds May 15, two Junior High Schools, several small grade schools. Foss & Co., Moorhead, archts. CD 3/28.

▲ **Minn., Stillwater**—SCHOOL—Bd. Educ., C. O. Hagen, clk., defeated proposal to authorize a **$1,700,000**

(Continued on page 142)

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(Continued from page 140)

bond issue, Junior High School and imprv. existing Senior High School. CD 2/8.

† **Mo., Kirksville**—POST OFFICE—General Services Admin., Pub. Bldgs. Service, 2306 E. Bannister Rd., Kansas City 14, Mo., post office on a lease-purchase basis. **$618,000.**

† **Mo., Marshfield** — POST OFFICE — General Services Admin., Public Bldgs. Service, 2306 E. Bannister Rd., Kansas City 14, Mo., post office bldg. on lease-purchase basis. **$530,000.**

Mo., St. Louis—HEALTH CENTER—City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 Blvd. and Market St., Zone 3, plans by Marcel Boulicault, Ambassador Bldg., 411 N. 7 St., Zone 1, health center, near Cass and Jefferson Aves., **$630,000.** Milligan & Horch, Ambassador Bldg., 411 N. 7 St., Zone 1, struc. engrs. Toensfeldt & Horch, 319 N. 4 St., Zone 2, elec. engrs. CD 6/7.

▲ **Neb., Kearney**—SCHOOL—Bd. Educ., defeated **$2,250,000** bonds May 15, schools, Kearney. Helleberg & Helleberg, Kearney, and Caudill, Rowlett, Scott & Assoc., Bryant, Tex., archts. CD 4/19.

▲ **Neb., Omaha**—SCHOOL—City plans by L. A. Daly Co., Insurance Bldg., public library. **$1,250,000.** —CD 3/22.

Neb., York—SCHOOL— Bd. Educ. voted **$575,000,** bonds May 16, school, J. W. Radotinsky, 903 McGee, Kansas City, Kan., archt. CD 4/18.

▲ **N. J., Elizabeth**—SCHOOLS—City, City Hall, plans by Leslie M. Dennis, 134 Elmora Ave., constr. Thomas Jefferson High School addn., reconstr. **$1,700,000,** CD 4/12; Battin High School addn., imprvs. and conversion **$2,800,000.**

▲ **N. J., Oakhurst**—BUILDING—Bd. Educ., Ocean Twp., Oakhurst, plans by Frederick Sessler, Holmdel Rd., Haslett building, Dow Ave. and Whale Pond Rd. **$1,125,000.**

▲ **N. J. Teaneck**—RECREATION, etc., Teaneck Twp. plans by Emile Gorham, 703 Penn. Ave., recreation bldg., swimming pool, auditorium, gymnasium, etc. club rooms, offices. **$1,250,000.**

▲ **N. J. Union**—SCHOOLS—Bd. Educ., Union Twp. Morris Ave., plans by Fred Elsasser, 2013 Morris Ave., Junior High School. **$2,300,000,** CD 3/16; Battle Hill school addn., **$350,000.**

▲ **N. J., West Orange**—SCHOOL—Bd. Educ., West Orange, plans by Frederic P. Weidersum, 85 W. Hawthorne Ave., Valley Stream, N. Y., St. Cloud School addn., **$350,000;** Gregory School addn., **$350,000;** 12-room elementary school, west end of town on Mt. Pleasant Ave., **$600,000;** plans by Kelly & Gruzen, 60 Park Place, Newark, Zone 2; high school addns., **$1,200,000.** To advertise for bids Oct. 1.

▲ **N. Y., Lindenhurst**—SCHOOLS—Bd. Educ. plans by Frederic P. Wiedersum Assoc., 85 W. Hawthorne Ave., Valley Stream, 3 elementary schools. **$3,800,000.** CD 3/8.

▲ **N. D., Fargo**—CIVIC CENTER—City, City Hall, voted **$1,725,000** bonds May 15, civic center. Foss & Co., 28 N. 3 St., Moorhead, Minn., archts. CD 5/4.

▲ **O., Columbus**—JUVENILE DIAGNOSTIC CENTER ADDN.—Ohio State Dpt. Mental Health & Correction, Dr. John D. Porterfield, dir., State Office Bldg., Zone 16, plans by Inscho, Brand & Inscho, 60 E. Broad St., 150-bed central reception and classification center addn. to Juvenile Diagnostic Center, **$1,500,000.**

▲ **O., Cleveland**—COURT HOUSE—Comrs. Cuyahoga Co., 413 Court House, Zone 13, plans by Dalton & Dalton, The Arcade, Zone 14, remodeling Lakeside Court House, incl. air conditioning. **$3,750,000.**

O., Twinsburg—SCHOOL—Bd. Educ., high school. **$589,000.**

O., Williamsport—SCHOOL—Bd. Educ., Beaver Local School Dist., Williamsport, school. **$576,000.**

▲ **Ore., Portland** — CLASSROOM-LIBRARY — State Bd. Higher Educ., Campus, Eugene, classroom and library for Portland State College. **$1,935,000.** To start late 1957. H & HFA loan approved.

▲† **Pa., Johnstown**—RESERVE TRAINING CENTER—U. S. Eng., 925 New Federal Bldg., Pittsburgh, Zone 19, U. S. Army Reserve Training Center, Goucher St. near jct. with Franklin St. in Upper Yoder Twp., Cambria Co., ENG-36-058-56-30.

Pa., Newtown Square—SCHOOL—Marple Newtown Joint School Bd., plans by Richard H. Peterman, West Chester, Senior High School. **$500,000.** Chester I. Duncan, Lewis Tower Bldg., Phila., consult. engr.

▲ **Tex., Beaumont**—CITY HALL, etc.—City, City Hall, city hall, civic center, coliseum (combination) **$2,500,000:** Stone & Pitts, 1872 Goodhue St., consult. engrs.

▲ **Tex., Fort Worth**—CLASSROOMS, etc.—Texas Womans College, c/o Poly Hgts., No. 1 classrooms bldg., **$950,000;** No. 2 classrooms bldg., **$1,000,000,** Chemistry, **$775,000,** another mens dormitory, **$750,000,** another dining hall, **$375,000,** another womens dormitory, **$850,000,** heating plant, **$200,000,** another gym, **$300,000,** campus development, (landscaping, turfing drainage, walks, etc.), **$150,000** (part of 10 year program).

▲ **Tex., Lufkin**—SCHOOLS—Lufkin Independent School Dist., Lufkin, voted bonds May 12, Elementary Schools No. 1, **$350,000;** No. 2, **$350,000;** No. 3, **$350,000.** CD 5/4.

▲ **Utah, Logan**—HIGH SCHOOL—Cache County School Dist., Logan, Central High School. **$1,800,000.**

▲ **Wash., Centralia**—JUNIOR HIGH SCHOOL—Schl. Dist. 401, voted bonds May 15, Junior High School, **$1,360,000,** W. A. Johnson & Assocs., Everett, archts. CD 3/16.

Wash., Puyallup—HIGH SCHOOL—School Bd., gymnasium addn. to high school. **$500,000.** CD 3/5.

▲ **Wash., Rosalia**—HIGH SCHOOL—School Dist. 256, voted bonds May 15, Junior High School, **$1,000,000,** V. L. Wulff, W. 1526 Riverside, Spokane, archt. CD 11/30

▲ **Wis., Whitefish Bay**—AUDITORIUM, etc.—School Dist., 1200 E. Fairmount Ave., Milwaukee, plans by Grassold-Johnson & Assocs., 734 N. Jefferson St., Milwaukee, Zone 2, school addn. **$1,200,000;** auditorium, **$900,000.** bond issue approved May 8.

▲ **Ont., Ottawa**—SERVICE and UTILITY—Ottawa Hydro-Electric Co., S. Lewis, genl. mgr., Sparks St., service and utility bldg., Albion Rd. **$1,000,000.**

COMMERCIAL BUILDINGS

▲ **Ala., Birmingham**—HOMES—Brizendine Constr. Co., 2144 Highland Ave., 100 homes, Green Springs Hy., S. of 21st. St. **$1,250,000.**

Ala., Birmingham—OFFICE—Birmingham Savings & Loan Assn., 2028 1st. Ave., plans by Bank Building & Equip. Corp. of America, consult. engrs. and archt., office bldg., 20th St. and 5th Ave. S. **$500,000.**

▲ **Ala., Birmingham**—HOMES—Paramount Development Co., 715 N. 39th St., 100 three-bedroom homes, Roebuck Garden Estates. **$1,500,000.**

Ala., Mountain Brook—CHURCH—McElwain Baptist Church, Montevallo Rd., Birmingham, Zone 9, plans by Van Keuren & Davis, consult. engrs.-archts., 3004 7 Ave. S., Birmingham, nine-unit church, educational bldg., parking area, **$500,000.**

▲ **Calif., Clovis**—SHOPPING CENTER—Clovis Shopping Center, Inc., c/o H. Schroeder, archt., Mason Bldg., Fresno, 86,000 ft., concrete block, steel, slab floor, gypsum roof, shopping center, parking area. **$1,250,000.**

▲ **Calif., Los Angeles**—DORMITORIES—University of Southern California, two dormitories, **$2,000,000.** H & FHA loan approved. CD 7/5/50.

▲ **Calif., Sacramento**—SHOPPING CENTER—Owner, c/o Wm. David & Assocs., archts., 988 Market St., San Francisco, shopping center, 60-acre site, Franklin Blvd. and Florin St. **$4,500,000.**

▲ **Conn., Bloomfield**—HOUSING, etc.—Tower Realty Co., 49 Pearl St., Hartford, 100-house development, Eddy St., **$2,500,000;** 20-acre shopping center, incl. department store and other smaller stores, Eddy St., **$500,000.**

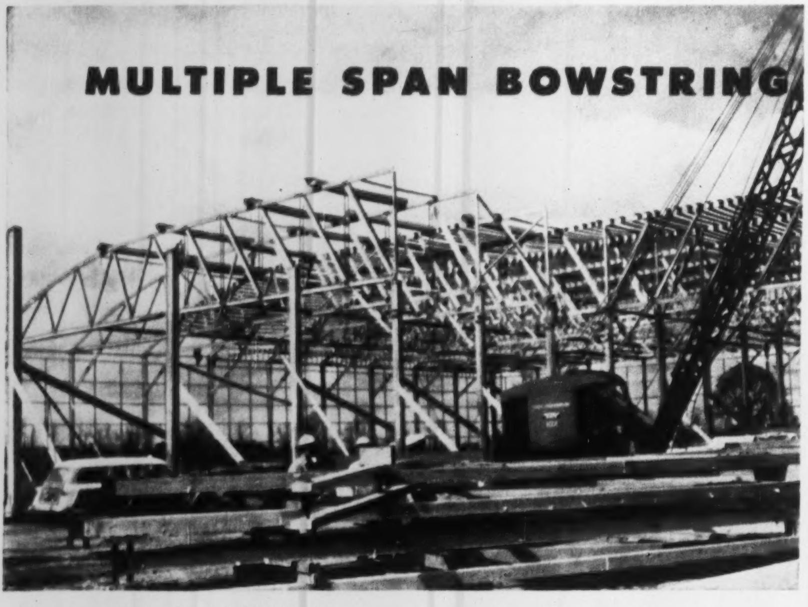
Conn., East Haven—SHOPPING CENTER—Owner, c/o Francis P. Barberio, atty., 129 Church St., shopping center, Route 1 and Main St. **$500,000.**

▲ **Conn., Monroe**—HOUSING—Monroe Center Homes, Inc., c/o Yudkin & Yudkin, 256 Main St., Derby, 84-house project, **$1,596,000.**

(Continued on page 144)

MULTIPLE SPAN BOWSTRING TRUSSES

with no valley build-up



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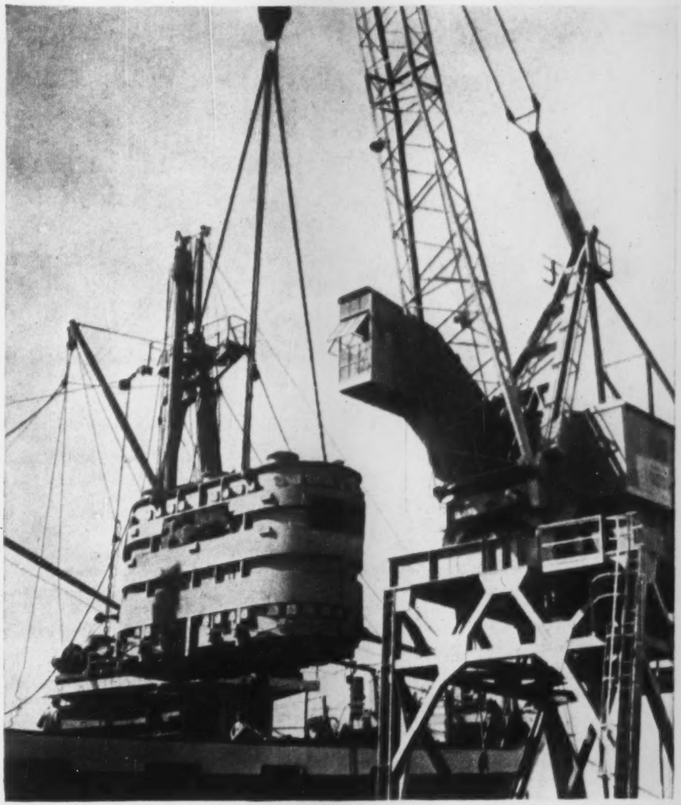

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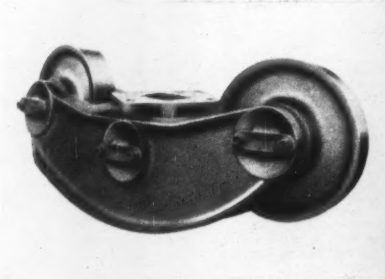

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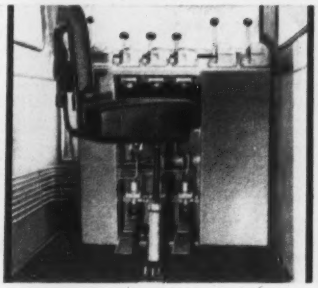

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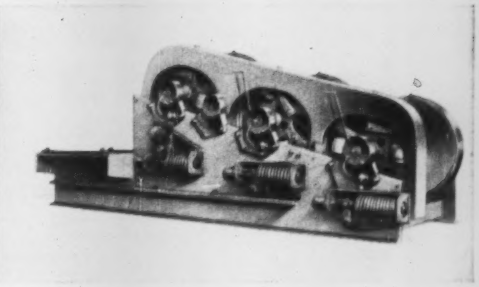

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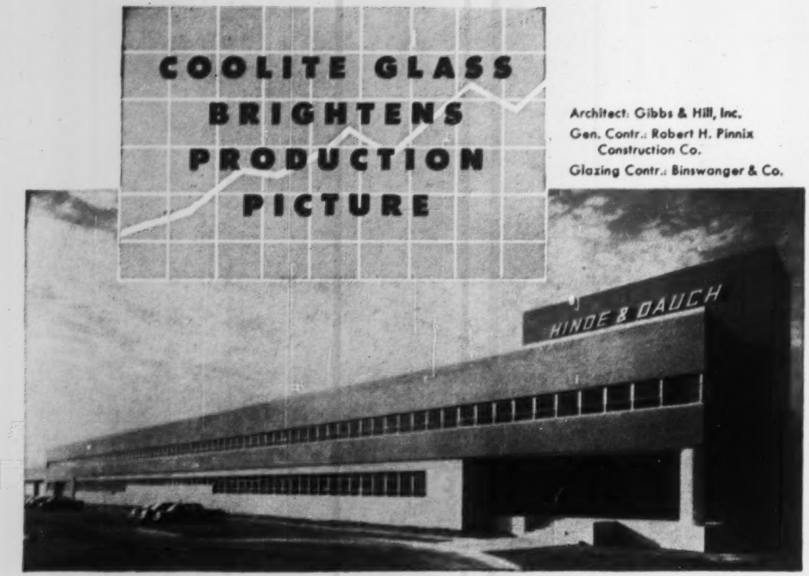

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with Steel Strapping

	Per 100	In 1000 lots Per 100
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-15″	9.85	8.95
-18″	11.50	10.50
-24″	16.00	14.50
-36″	24.00	22.50
⅝″x1⅝″-12″	6.15	5.60
-15″	6.60	6.00
-18″	7.50	6.50
-24″	11.00	10.00
-36″	16.00	14.00

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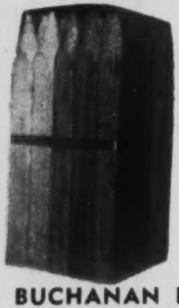

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(Continued from page 142)

Conn., New Britain—HOUSING—Built-Well Homes Corp., 130 Hudson St., Hartford, 75 house development, Osgood Ave. **$862,500.**

▲ **Conn., New Haven**—OFFICE, etc.—Southern New England Telephone Co., 227 Church St., plans by Douglas Orr, 111 Whitney Ave., 4 story, office bldg., College St. exten. and 600-car parking lot. **$2,000,000.**

▲ **Conn., Plainville**—HOUSING—Walter D. Sullivan, 192 Lincoln St., New Britain, 130-house development, Pinnacle Farm, **$2,600,000.**

Fla., Miami Beach—HOTEL—Owner, c/o Saltonstall, Morton & Morton, archts., 53 State St., Boston, Mass., hotel addn., Collins and 87 Sts. **$500,000.**

▲ **Ill., Evanston**—DORMITORIES—Northwestern University, 619 N. Clark St., plans by Holabird, Root & Burgee, 180 N. Wabash Ave., Chicago, women's dormitory, Orrington and Chicago Aves., University Pl. **$1,600,000.** men's dormitory, west side of Sheridan Rd. between Lincoln and Dartmouth Pl. **$1,600,000.**

▲ **Ind., Indianapolis**—SHOPPING CENTER—Meadows Shopping Center, Inc., 3939 Meadows Lane, plans by Sidney M. Morris, 134 N. LaSalle St., Chicago, Ill., 150,000 sq. ft. shopping center. **$2,000,000.**

▲ **Iowa, Cedar Falls**—SHOPPING CENTER—H. Shanedling Sons Corp., 2025 Nicollet Ave., Minneapolis, Minn., plans by Thorshov & Cerny, 400 Metropolitan Bldg., Minneapolis, Minn., shopping center, **$2,500,000.**

▲ **Iowa, Marshalltown**—HOSPITAL—Mercy Hospital, Marshalltown, hospital addns. **$1,000,000.**

Mich., Coldwater—HOMES—Prospect Hill Constr. Co., Ann Arbor, 60 to 65 homes, south and east of Health Center in Bailey Addn., in northwest section of city. **$550,000.**

Mich., Detroit—HOTEL—Fort Shelby Hotel, 525 West Lafayette, Zone 26, 3 story hotel addn., Second and West Lafayette. **$750,000.**

▲ **Mich., Detroit**—HOTEL—Owner, c/o Conrad N. Hilton, Hilton Hotel, 720 S. Michigan St., Chicago, Ill., hotel, Wayne, Shelby, West Larned and West Jefferson Sts., across from new civic center, **$24,000,000.**

▲ **Mich., Roseville**—HOSPITAL—Roseville Hospital, Dr. Mark E. Maun, Md., et al, 1551 David Whitney Bldg., Detroit, Zone 26, hospital, Little Mack north of 12 Mile Rd. **$1,000,000.**

▲ **Mich., St. Clair Shores**—SHOPPING CENTER—Owner, c/o Charles N. Agree, Inc., archt., 1140 Book Bldg., Detroit, Zone 26, shopping center, incl. 25 stores, 13 Mile Rd. and Harper Rd. **$1,500,000.**

▲ **N. J., East Orange**—DORMITORY WINGS—Upsala College, 345 Prospect St., plans by J. F. Lason, Reynolda, N. C., two dormitory wings on west side of bldg. **$2,070,000.** Bids in 90 days.

▲ **N. Y., New York**—APARTMENTS—Nathan Blaser, c/o H. Herbert Lilien, archt., 201 W. 72 St., Zone 23, two 6 story apartments, Webster Ave. and 236 St. **$1,000,000.** To go ahead in Fall 1956.

N. Y., New York—RECREATIONAL CENTER—Children's Aid Society, 105 E. 22 St., Zone 10, plans by Gibbons & Heidtmann, 211 E. 37 St., Zone 16, children's recreational center and clinic, 15-39 W. 1117 St. **$600,000.** CD 7/8/54.

▲ **N. Y., New York**—OFFICE—515 Park Ave. Corp., 120 Wall St., New York, Zone 5, plans by Emery Routh & Sons, 575 Madison Ave., Zone 22, conversion of apartment at 515 Park Ave. into office. **$1,400,000.**

▲ **N. Y., New York**—RESEARCH CENTER—N. Y. Women's League for Animals, 350 Lafayette St., Zone 12, plans by Chapman, Evans & Delehanty, 50 Broadway, Zone 4, 10 story veterinary research center, 10-12 Bond St. **$1,300,000.**

O., Cleveland—BUILDING ADDN.—The Temple, Ansel Rd. and E. 105 St., plans by Michael M. Kane 12381 Cedar Rd., Cleveland, Zone 6, and Perkins & Will, 309 A Jackson St., Chicago, Ill., building to house large auditorium, classrooms. **$500,000.**

▲ **O., Dayton**—HOMES—Rodenbeck Realty & Development Co., 4800 Air Way Rd., 270 homes, 135-acre site, east of Marshall Rd. and north of Whipp Rd., Washington Twp. **$3,000,000.**

▲ **O., Dayton**—HOMES—Albert E. Smith & Paul E. Lapp, 727 Cottonwood St., 100 homes, 52-acre site near corner Rte. 48 and Whipp Rd., Washington Twp. **$1,000,000.**

▲ **Okla., Bartlesville**—DWELLINGS—Hughes Development Co., Tampa, Tex., 900 frame, sheetrock, dwellings. **$10,000,000.**

▲ **Pa., Beaver Falls**—HOSPITAL—Providence Hospital, 3rd Ave., plans by Press C. Dowler, Magee Bldg., Pittsburgh, hospital addn. and alteration. **$1,000,000.**

Pa., Bristol—SHOPPING CENTER, etc.—Herbert E. Black & Thomas Taylor, Newportville and Emilie Rds., shopping center, near Route 413, proposed supermarket, and several small stores. **$500,000.**

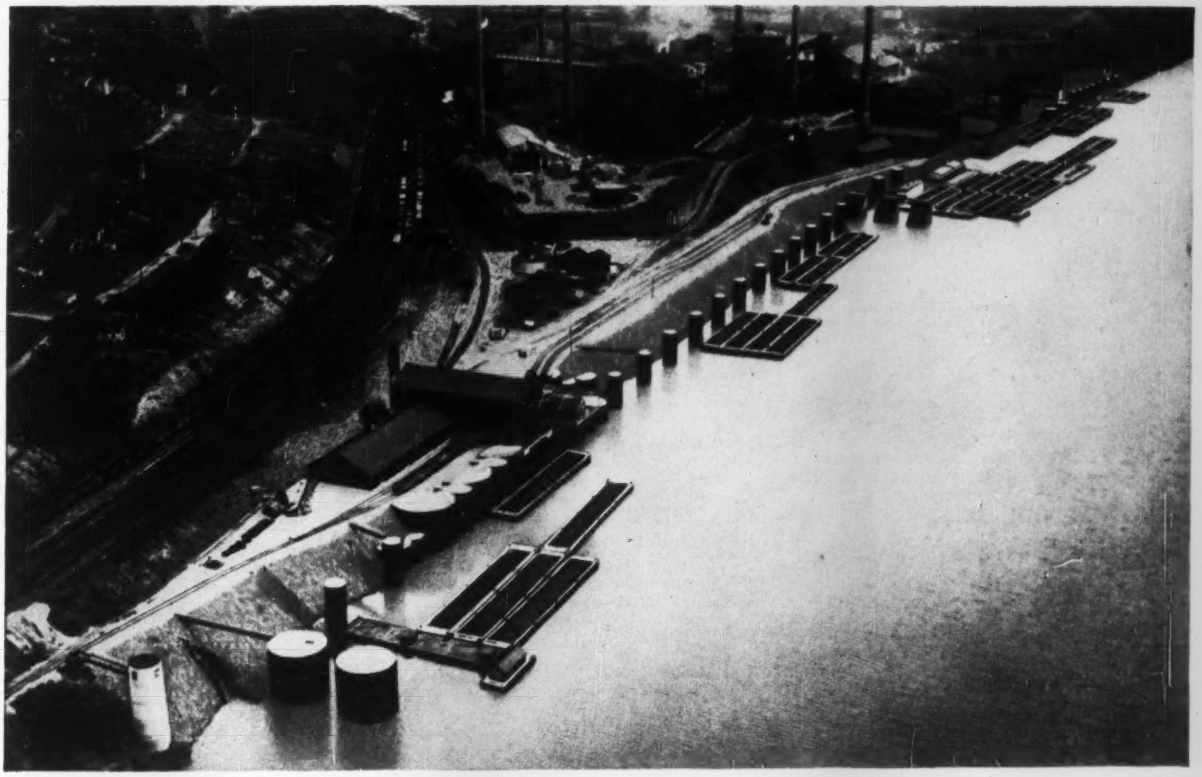
▲ **Pa., Gettysburg**—DORMITORIES—Gettysburg College, Gettysburg, plans by J. Alfred Hamme, York, 2 dormitories, **$1,035,000.**

▲ **Pa., Irwin**—SHOPPING CENTER—Soffer Realty Co., 2100 Fifth Ave., McKeesport, plans by Charles Roberts, 5991 Center Ave., Pittsburgh, 2 and 3 story, 210,000 sq. ft. brick, block Norwin Shopping Center. **$1,000,000.**

Pa., Phila.—OFFICE, etc.—Penn. Federal Savings & Loan Assn., 1623 Walnut St., plans by Solomon Kaplan, 2120 Spruce St., 2 story, 42x117 ft., brick, concrete, office and bank bldg. **$500,000.**

Pa., Pittsburgh—SHOPPING CENTER—Landau Developers, 125 1st Ave., plans by Hoffman & Crumpton, Century Bldg., 1 story, 400,000 sq. ft., brick, block Fort Couch Shopping Center, Upper St. Clair Twp. **$500,000.**

(Continued on page 146)



DRAVO EXTENDS WEIRTON STEEL'S DOCK AND HARBOR

Economy-minded business management is using river transportation to move increasingly larger tonnages of raw materials and finished goods. To realize the full potential savings, adequate docking and harbor facilities must be available to transfer cargoes with minimum delay.

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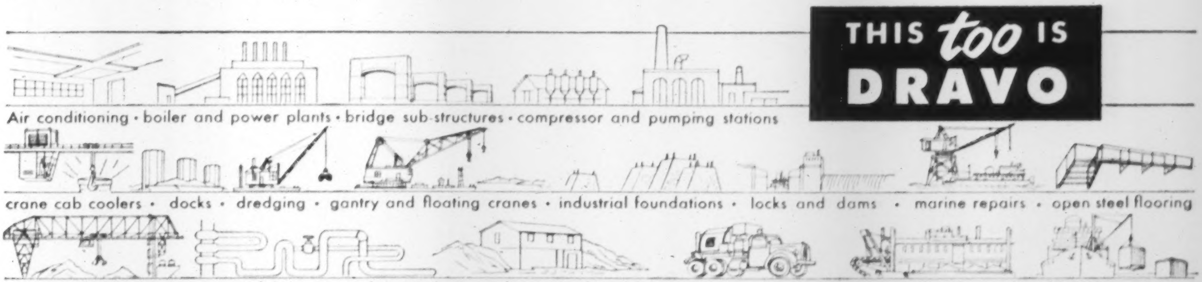

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slopes and shafts • space heaters • towboats and barges and river transportation • tunnels • unloaders • water and waste treatment plants

(Continued from page 144)

R. I., Providence—OFFICE—Howard Realty Co., 171 Westminster St., office bldg., Westminster and Dorrance Sts. **$500,000.**

▲ **Tex., San Antonio**—MEDICAL CENTER—San Antonio Medical Foundation, c/o Bd. Directors, Dr. Harold Vagtborg, chn., 8500 Culebra St., medical center, 200-acre site north of Oak Hills between Fredericksburg and Babcock Rds. **$5,500,000.**

▲ **Wash., Seattle**—STORE and OFFICE—Pacific Warehouse Co., Terminal Sales Bldg., Zone 1, plans by J. Graham & Co., 1426 5 Ave., 9 story store and office bldg., 2 Ave and Virginia St. **$1,400,000.** CD 5/21.

▲ **Alta., Edmonton**—SHOPPING CENTER—D. S. Gray, c/o American Rediscount Corp., 120 Broadway, New York, N. Y., U.S.A., shopping center, incl. 2 supermarkets, department store and 41 other shops, and parking area, White Ave. and 85 St. **$4,000,000.**

▲ **Ont., Orleans**—REST HOME—Sisters of the Grey Nuns, Ottawa, reconstruct rest home, "Villa St. Louis", 7 mi. east of Ottawa, **$1,000,000.**

▲ **Ont., Toronto**—OFFICE—Sun Life Assurance Co. of Canada, Sun Life Bldg., Montreal, Que., plans by John B. Parkin Assocs., 1500 Don Mills Rd., Postal Station "J", Toronto, 8 story, 175,000 sq. ft., stone, glass office underground parking, **$2,000,000.** Work early next year. CD 3/9.

▲ **Que., Joliette**—HOSPITAL—St. Charles de Joliette Hospital Corp., C. E. **Hetee,** secy., plans by P. Rinfret, 1134 Chemin St. Louis, Sillery, mental hospital, **$15,000,000.**

▲ **Que., Montreal**—ENGINEERING—Bd. Governors McGill University, Montreal, engineering bldg. **$1,500,000.**

INDUSTRIAL BUILDINGS

▲ **Alabama**—POWER PLANT—Alabama Power Co., Alabama Power Co. Bldg., Birmingham, power plant at Lock 13 on Warrier River, Tuscaloosa Co. **$25,000,000.**

▲ **Alabama**—STEAM GENERATING PLANT—Southern Electric Generating Co., (Southern Co., 250 Park Ave., New York, Alabama Power Co., Ala. Power Co. Bldg., Birmingham, Ala. and Georgia Power Co., 75 Marietta St. N. W., Atlanta, Ga.), first unit 500,000 kw. steam generating plant on Coosa River between Lay Dam and proposed Kelly Dam, **$75,000,000,** completion by 1961; second unit 500,000 kw. **$75,000,000,** completion by 1963.

Ala., Florence—PLANT—**National Pool Equipment Co.,** Florence, plant, **$500,000.**

▲ **Ga., Atlanta**—PLANT—Ford Motor Co., 3000 Schaefer St., 450,000 sq. ft. automobile assembly plant, near here, **$4,000,000.** Samborn, Steketee & Assoc.

Ill., Chicago—FACTORY—Atlantic Brass Works, Inc., 2600 W. Addison St., plans by H. N. Johnson, 4850 N. Winchester, 1 story, brick, factory bldg. **$500,000.**

▲ **Ind., Bloomington**—FACTORY, etc.—Westinghouse Electric Co., Atomic Power Div., Bettis Field Pittsburgh, Pa., factory and offices, **$2,000,000.** Griffels & Vallette, 1000 Marquette Bldg., Wayne and Congress, Detroit, **Mich., consult. engrs.**

▲ **Ind., Indianapolis**—PLANT—Joseph T. Ryerson & Son, Inc. (Inland Steel Co.), 2558 W. 16 St., Chicago, Ill., steel service plant, 14-acre tract between U.S. 40 and U.S. 52 west of Ind. 100. **$1,000,000.** Work to start in 1956.

▲ **Iowa, Fort Dodge**—PLANT, etc.—Celotex Corp., 120 S. LaSalle St., Chicago 3, Ill., gypsum board plant and plaster board mill. **$6,000,000.**

▲ **Mass., Boston**—PARKING GARAGE—Court Street Parking Co., 1359 Hancock St., Quincy, parking garage, Court St. and City Hall Ave. **$1,000,000,** William A. Fisher Co., Inc., 14 Court Square, Boston, cousult. engr.

▲ **N. Y., Buffalo**—WAREHOUSE—Skyway Terminal Corp., c/o Edward P. Jackson, 131 Hawkins Ave., Hamburg, 1 story, 500,000 sq. ft. warehouse, S. Michigan and Fuhrman Blvd., **$5,000,000.**

▲ **N. Y., Lackawanna**—OFFICE—Bethlehem Steel Co., Bethlehem, Pa., plans by McKim, Mead & White, 101 Park Ave., New York, office, 6 story tower on 80 acre plot adjacent to production area, **$2,000,000.** CD 1/31.

▲ **O., Cleveland**—PLANT—The Yoder Co., 5500 Walworth Ave., Zone 2, plant, Detroit and Canterbury Rd., Westlake. **$4,500,000.** McGeorge-Hargett & Assoc., 7016 Euclid Ave., Zone 3, consult.-engrs. CD 11/9.

▲ **Ore., Toledo**—PULP MILL—Georgia-Pacific Plywood Co., American Bank Bldg., Portland, kraft pulp mill. **$17,000,000. Sandwell & Co., 120 6th Ave. N.,** Seattle, Wash., consult. engrs.

▲ **Pa., Phila.**—MANUFACTURING—Owner, c/o Max Haupt, consult. engr., 229 N. 60 St., Phila., 1 and 2 story, brick, steel, 2,500,000 sq. ft. mfg. bldg. **$2,000,000.** Bids about June 15.

▲ **Pa., Pittsburgh**—WAREHOUSE—The Allgheny Cold Storage Co., 112 Richmond Circle, Perrysville, plans by John A. Grove Assoc., 615 W. Diamond St., 1 story, 61,500 sq. ft., brick, block, steel warehouse, **$1,500,000.**

▲ **Pa., Pittsburgh**—PLANT—Rieck Dairy Co., Div. of National Dairy, 1345 Forbes St., plans by Hunting, Larsen & Dunnells, Century Bldg., 1, 2 and 3 story, 250x250 ft., brick, steel milk plant. **$3,500,000.**

Pa., Pittsburgh—RESEARCH LABORATORY—Westinghouse Electric Corp., Atomic Power Div., Bettis Field, 3 story, bsmnt., brick, block, steel, research laboratory addn., Churchill Boro. **$500,000.**

Tex., Lubbock—COTTON-CLASSING—Wylie Briscoe, c/o Haynes & Kirby, archts., 1902 Dixie Dr., cotton-classing bldg., masonry constr. **$550,000.**

▲ **Va., Norfolk**—GRAIN ELEVATOR—Cargill Inc., Grain Exchange Bldg., Minneapolis, Minn., 2,100,000 bu. export grain elevator on waterfront, 20 steel tanks, loading and unloading docks, etc. **$1,500,000.**

▲ **Va., Portsmouth**—GENERATING UNIT—Virginia Electric & Power Co., 7 and Franklin Sts., Richmond, 150,000 kw generating unit and structural unit to house generating facilities. **$22,000,000.** Project planned for early 1957. Stone & Webster Eng. Corp., 1403 Roseneath Rd., Richmond, consult. engrs.

▲ **Va., Yorktown**—GENERATING UNIT—Virginia Electric & Power Co., 7 and Franklin Sts., Richmond, 150,000 kw generating unit and structural unit to house generating facilities. **$21,000,000.** Project planned for early 1957. Stone & Webster Eng. Corp., 1403 Roseneath Rd., Richmond, consult. engrs.

Wis., Wild Rose—FACTORY—Wild Rose Community, Inc., 1 story, 160x320 ft., concrete, steel, concrete blocks factory. **$500,000.**

▲ **Phillipine Islands**—RUBBER PLANTATION—Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, O., rubber plantation. **$5,300,000.**

Ont., Brantford—PLANT—Steel Co. of Canada Ltd., Wilcox St., Hamilton, plant, Over **$500,000.** CD 11/19/49.

▲ **Ont., Simcoe**—FACTORY—Canada Wire & Cable Co., Leaside, 100,000 sq. ft., brick, concrete blocks, steel, factory, No. 3 Hy. south of C.N.R. tracks, **$1,000,000.**

UNCLASSIFIED

▲ **Conn., Waterbury**—PARKING AREA—Waterbury Parking Auth., City Hall, parking area, Cottage Pl., **$500,000.** parking area, Spring, Brook and Scovill Sts., **$500,000.**

New Mexico—ELECTRIC DISTRIBUTION LINE, etc.—Socorro Electric Co-operative, 194 mi. electric distr. line and system imprvs. **$592,000.** CD 5/17/50.

▲ **Okla., Tulsa**—FAIRGROUNDS IMPRVS.—Tulsa Co., Court House, bond election July 24, fairgrounds bldgs. **$1,300,000.** CD 11/22.

▲ **Texas**—GENERATING PLANT, RURAL DISTRIBUTION LINES—Brazos Electric Power Co-operative, 902 Amicable Bldg., Waco 33,000 kw steam generating plant, near Bridgeport; 108 mi. new rural distr. lines. Total est. **$7,500,000.** CD 6/6.

▲ **Texas** — RURAL DISTRIBUTION LINES — Coleman County Electric Co-operative, Coleman, rural distr. lines, sys. improvs., Coleman, Concho, Runnels, Taylor, Brown, Coke, Tom Green, Callahan Counties. **$1,583,000.**

Ont., Ottawa—SUB-STATION—Ottawa Hydro-Electric Co., Sparks St., sub-station, Slater St. **$100,000,** underground wiring, Carling Ave., **$500,000.**

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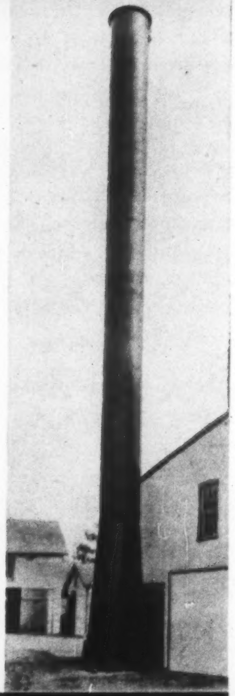

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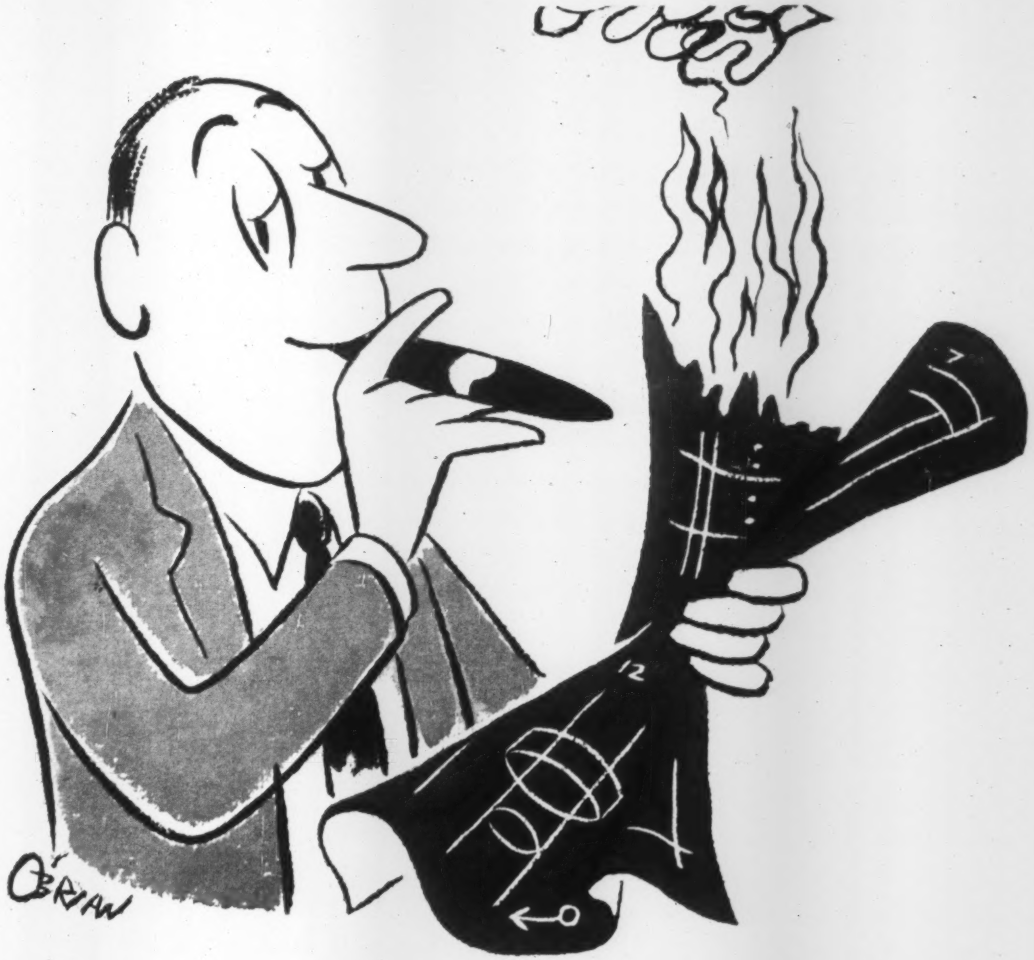

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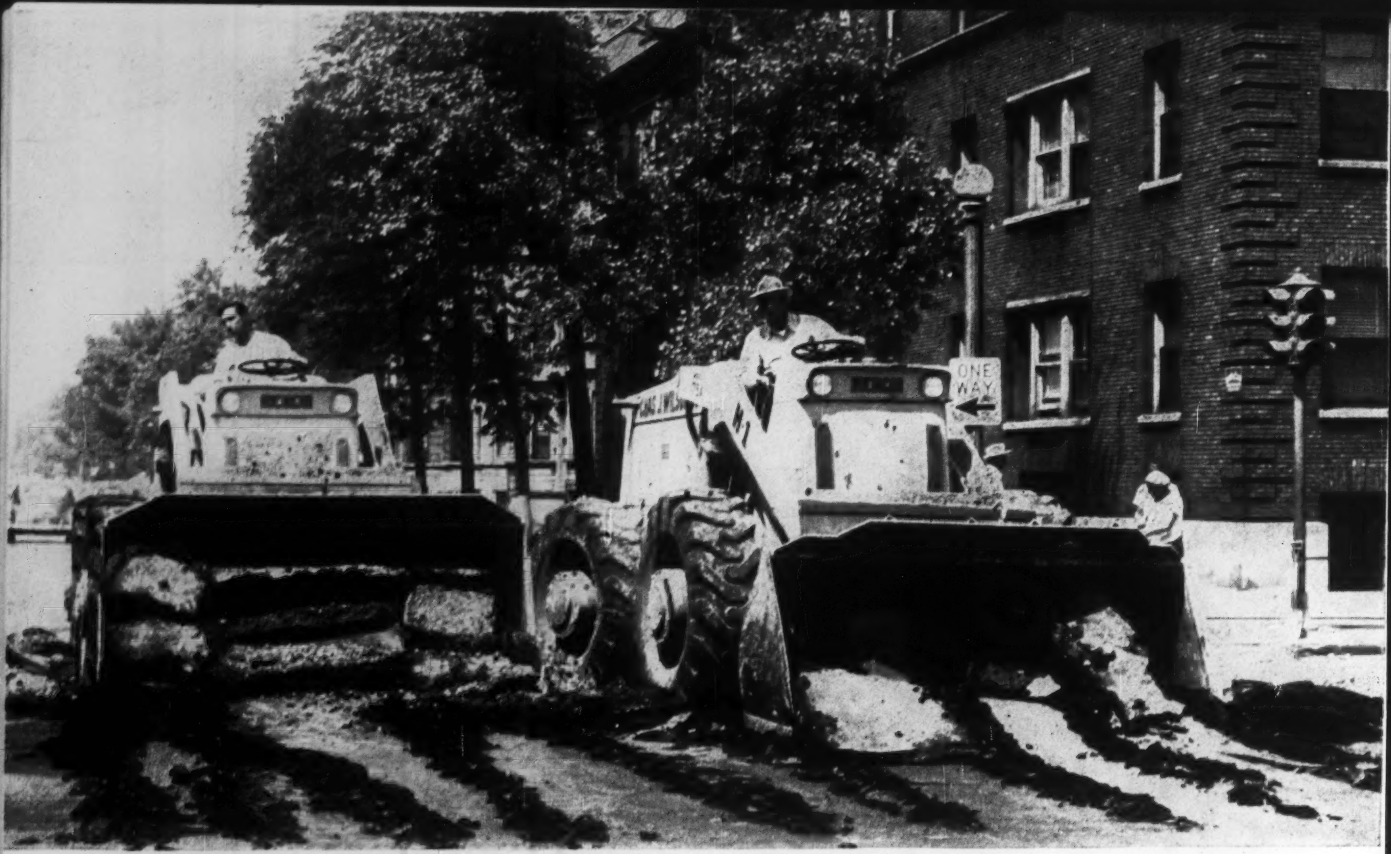

Two 2¼ yd. Michigans strip asphalt after scarifying with retractable teeth mounted on bucket.

Strips 3600 yds. of asphalt in 8 hours with two Michigan 175A Tractor Shovels

More and more contractors are finding that Michigan Tractor Shovels will handle jobs that have always been considered too tough for rubber-tired equipment. Here's a case in point. C. J. Wilson, Chicago contractor, fitted 1-inch steel scarifier teeth to one of his two Michigan 175A Tractor Shovels to remove 3½ miles of old asphalt on two four-lane streets.

The asphalt surface averaged 3 to 4-inches thick, up to 9-inches at some intersections—a mixture of asphalt, limestone dust, stones up to 1-inch diameter and chunks of concrete—average weight about 3200 lbs. per yard. Wilson found that his two Michigans handled the job 70% faster than a crawler-loader and one Michigan.

C. J. Wilson inspects the 1" steel scarifier teeth he installed on his Michigan 175A.

Used crawler and Michigan

Before he decided to use the scarifier, Wilson used a crawler-loader to cut and scrape the asphalt and loaded it with a 2¼-yard Michigan 175A. This method produced oversized hunks of asphalt up to 20 ft. square which had to be broken up before they could be loaded out. When the weather was hot, the "breaking-up" chore was stubborn and time-consuming. Furthermore, the crawler tracks damaged the macadam base.

Michigans scarify and load

With the heavy-duty scarifier teeth on the Michigan, Wilson found that he could cut the asphalt into strips as much as a block long. The teeth engage when the bucket is dragged backwards with down-pressure to hold them in the asphalt. On the forward pass, they retract automatically and do not interfere with normal use of the bucket.

The two 2¼ yd. Michigans worked a tandem operation. One did all the cutting so fast that it doubled back to assist the other machine which spent full time loading and cleaning-up. Production was as high as 3800 yds. in 8 hours, averaged 3600 yds.—compared to 2100 yds. a day the old way.

Handles tough jobs on rubber

Like C. J. Wilson, many other Michigan owners are finding that this Tractor Shovel will actually improve production on jobs which have never even been tried on rubber. The complete power-train—torque converter, power-shift transmission, planetary axles—was designed and built entirely by Clark, specifically engineered to give this machine more useable power and traction than you've ever seen on rubber. For proof, ask your Michigan distributor to demonstrate. You name the job!

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NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
June 11, 18 Connecticut
STREETS AND ROADS
June 11, 18 Connecticut

▲† **Me., Topsham**—FACILITIES—BA 6/20—U. S. Eng., 150 Causeway St., Boston, Mass., air force facilities, airmen's dormitory, mess, warehouse, cold storage, utilities, site work, Air Force Station, ENG-19-016-56-124. $1,250,000. Plans deposit $20, refundable. Alonzo J. Harriman, Inc., 292 Court St., Auburn, archt. CD 5/23.

▲ **Conn., West Hartford**—BA 7/11—Town, municipal incinerator. $1,200,000. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., consult. engrs. CD 12/29/54.

BUILDINGS—BA

▲ **Mass., Framingham** — SCHOOL — BA 6/14 — Town, School Bldg. Comn., c/o Supt. Schools, Brookwater Elementary School, Water St., Saxonville area, $1,037,000. Plans deposit $100, refundable. M. A. Dyer Co., 24 School St., Boston, archts. Bids 2/9 rejected. CD 1/10.

HEAVY CONSTRUCTION—LB & CA

▲ **James S. Kelliher,** 1245 Hancock St., Quincy, Mass. LB **$1,373,358,** Alt. **$1,492,000.** Contr. W-702, Contr. 1, Commonwealth Pier No. 5, South Boston, BOSTON, MASS. Commonwealth of Mass., Port of Boston Comn., c/o Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. Bids May 25. CD 5/1.

BUILDINGS—LB & CA

▲ **Waggaman & Collyer,** 178 Dix Ave., Glens Falls, N. Y. CA **$1,134,265.** superstructure PAPER MACHINERY BLDG., WOODLAND, ME. St. Croix Paper Co., Woodland, Me. CD 5/22, under CA.

▲ **Gilbane Bldg. Co.,** 90 Calverley St., Providence, R. I. CA **$1,400,000.** 1 story, 130,000 sq. ft. brick MANUFACTURING PLANT, STRATFORD, CONN. Belknap Mfg. Co.,-Div. of Detroit Controls, Inc., 800 Union Ave., Bridgeport, Conn. Fletcher-Thompson, Inc., 211 State St., Bridgeport, Conn., archt. Awarded May 24.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
June 15 Pennsylvania June 28 New York

HEAVY CONSTRUCTION—LB & CA

▲† **Norair Engineering Co.,** 1122 22 St. N. W., Wash., D. C. CA **$2,283,000.** consolidation of steam heating plants, Naval Air Station, NOy 92007, PATUXENT RIVER, MD. Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Awarded May 29. CD 5/5, under LB.

BUILDINGS—LB & CA

▲ **Bellmore Gardens Homes,** c/o Henry A. Klar Realty Co., 220-02 Horace Harding Blvd., Bayside Hills, N. Y. Owner Builds. **$1,000,000.** 66 HOUSES on tract at South St. Marks Ave., BELLMORE, N. Y.

▲ **John W. Rouse Constr. Corp.,** Gouverneur, N. Y. CA **$1,717,118.** JUNIOR-SENIOR HIGH SCHOOL, CARTHAGE, N. Y. Carthage Central School Dist., Carthage, N. Y. Bids Apr. 26, awarded May 2. CD 5/4, under LB.

▲ **F. D. Rich Co., Inc.,** 322 Main St., Stamford, Conn. LB **$6,577,000.** (3 bidders) general constr. MEDICAL-SURGICAL CENTER (Bldg. No. 86) Gowanda State Homeopathic Hospital, HELMUTH, N. Y. Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany, N. Y. Bids May 24. CD 5/24, under LB;
Joseph Davis, Inc., 120 W. Tupper St., Buffalo, N. Y. LB **$608,733** (2 bidders) heating work (Helmuth, N. Y.);
John H. Knox Co., Inc., 1736 Fillmore Ave., Buffalo, N. Y. LB **$674,474.** (5 bidders) sanitary work (Helmuth, N. Y.);
Volker Bros., Inc., 891 Washington St., Buffalo, N. Y. LB **$501,500.** (3 bidders) electrical work (Helmuth, N. Y.).

▲ **Huntington Acres Homes,** c/o Harry Kline Realty Co., 26 W. Jericho Turnpike, Huntington Station, N. Y. Owner Builds. **$2,225,000.** 100 HOUSES on tract on Pulaski Rd. east of New York Ave., HUNTINGTON, N. Y.

▲ **Huntley Gardens Homes,** c/o Main Line Realty Corp., Jericho Turnpike, Selden, N. Y. Owner Builds. **$2,400,000.** 150 HOUSES on 40 acre tract on Caxman Rd., south of Southern State Parkway, MASSAPEQUA, N. Y.

▲ **Brookwood Homes,** c/o Albert B. Mecklenburg Org., 1038 Northern Blvd., Roslyn, N. Y. Owner Builds. **$1,400,000.** 31 HOUSES on tract on Glen Cove Rd. north of Northern Blvd., OLD BROOKVILLE, N. Y.

▲ **Harbor Hill Homes** c/o Herman H. York, archt., 90-04 161 St., Jamaica, N. Y. CA Est. **$3,600,000.** 165 HOMES on tract at Port Washington Blvd. and Sandy Hollow Rd., PORT WASHINGTON, N. Y.

▲ **Rolaig Park Homes,** c/o Harry Klein Realty Co., 26 W. Jericho Turnpike, Huntington Station, N. Y. Owner Builds. **$2,200,0000.** 200 HOUSES on tract on Montauk Hy., WEST SAYVILLE, N. Y.

▲ **Joseph & Manuel J. Gibbs,** 1 Ridge Road, Lyndhurst, N. J. Owner Builds. **$1,950,000.** 60 HOMES, White Beeches Estates development, Prospect St. and White Beeches Dr., DUMONT, N. J. Percy Simon, 362 Cedar Lane, Teaneck, N. J., archt.

▲ **Brentwood Hills Estates** c/o Harsen & Johns, archts., Summit St. and Piermont Rd., Tenafly, N. J., Owner Builds. **$4,000,000.** 120 HOUSES on 60-acre tract at Summit Ave. and Chestnut St., ENGLEWOOD CLIFFS, N. J.

▲ **Oradell Village Homes,** c/o Peter H. Butler, archt., 172 State St., West Englewood, N. J., Owner Builds. **$2,700,000.** 100 HOUSES on tract on Prospect Ave. south of Ridgewood Road, ORADELL, N. J.

SOUTH

BUILDINGS—BA

▲† **Va., Fort Lee**—BARRACKS—BA On Or About 6/26—U. S. Eng., foot of Front St., Norfolk, Zone 1, 8 enlisted men's barracks ENG-44-110-56-35. $4,500,000. Lublin, McGaughy Assocs., 220 W. Freemason **St., Norfolk, engrs.-archts.**

HEAVY CONSTRUCTION—LB & CA

▲† **VIRGINIA**—Bureau P. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington,
Nello L. Teer Co., P. O. Box 1131, Durham, N. C., LB **$1,621,775** (5 bidders) paving, etc. from Ballard Creek to Yorktown and Williamsburg to Jamestown Island Colonial Parkway, York and James City Counties. Bids May 22. CD 4/26.

▲† **American Asphalt Products, Inc.,** 60 P St. S. E., Wash., D. C. LB **$1,368,750** Item 1, **$1,321,974** Item 2, **$1,226,191** Item 3 (3 bidders) constr. approx. 5.6 mi. b. conc. road, two bridges, three culverts, exten. of two existing culverts at Marine Corps Schools, NOy 91986, QUANTICO, VA. Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids May 29. CD 4/30.

▲† **Williams Constr. Co.,** Middle River, Baltimore, Md., CA **$1,810,032,** runway exten., taxiway and apron, Air National Guard, Martinsburg Municipal Airport, MARTINSBURG, W. VA. U. S. Eng., 237 Fourth Ave., Huntington, W. Va. Bids Apr. 24, awarded Apr. 30. CD 5/1, under LB.

▲ **FLORIDA**—State Road Dpt., Tallahassee,
Noonan Constr. Co., Drawer 470, Pensacola, Fla., LB **$1,575,738,** est. $800,000 2 concrete slab deck bridges on prestressed concrete girders and prestressed concrete pile bents, 1,056 lin. ft. and 1,452 lin. ft. long, respectively, over Five Mile Bayou and Garniers Bayou, Job 5704-112, SR 85, Okaloosa Co. Bids May 24. CD 5/4.

▲ **FLORIDA**—State Roads Dpt., Tallahassee,
Hardaway Contr. Co., Box 1360, Columbia, Ga., LB **$2,070,276,** est. $2,000,000 1 bridge providing two 21 ft. roadways and two 5-ft. sidewalks, designated as Structure A; 2 parallel bridges each providing 24-ft. roadway and two 5-ft. sidewalks, designated as Structure "B"; Ringling Causeway Bridge across Sarasota Bay, SR 780, Job 1703-175, Sarasota Co. Bids May 24. CD 4/26.

▲ **FLORIDA**—State Road Dpt., Tallahassee,
R. H. Wright & Son, Inc., Box 780, Ft. Lauderdale, Fla., CA **$1,218,885,** maint. traffic heavy excav., base with b. conc. surf. course, binder course, 106 ft. concrete slab bridge on concrete piling, 160.54 ft. concrete steel bridge on concrete piling, storm sewers, etc. 3.077 mi. SR 7, US-12 (4), (Job 8714-203) Dade Co. Bids May 3. CD 5/9, under LB.

▲† **Blake Constr. Co.,** 33 E. St. S. W., Wash., D. C. CA **$3,048,000.** family HOUSING, Marine Corps Schools, NOy 92036, QUANTICO, VA. Dist. P. Wks., Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids May 16, awarded May 29. CD 5/18, under LB.

BUILDINGS—LB & CA

▲ **H. L. Coble Constr. Co.,** 1705 Battleground Ave., Greensboro, N. C. CA **$1,433,209.** SHOPPING AREA, GREENSBORO, N. C. Friendly Center, Inc., 3900 Starmount Dr., Greensboro, N. C. McMinn Norfleet & Wicker, 2828 Lawndale Dr., Greensboro, N. C., archts.

▲ **Clutter Constr. Corp.,** 377 Westward Dr., Miami Springs, Fla., CA **$2,299,000.** Norland, Rainbow Park, Tropical, West Palm Springs, Westwood Village, Westwood Lake, Richmond Heights Elementary SCHOOLS, MIAMI, FLA. Bd. P. Instruction, School Admin. Bldg., 275 N. W. 2 St., Miami, Fla. Bids May 16, awarded May 22. CD 5/23, under LB.

▲ **Barksdale & LeBlanc,** Box 1567, Baton Rouge, La. LB **$2,014,000.** (8 bidders) 7 story, bsmnt., 75,000 sq. ft. brick HOSPITAL addn., BATON ROUGE, LA. Our Lady of the Lake Hospital, Across Dyke, Baton Rouge, La. Bids May 22. CD 4/20.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
July 24 Ohio

▲ **O., Toledo**—BA 6/19—City, John Alspach, city serv. dir., City Hall, Contr. No. 90B water main imprvs. North Side Trunk Main Div. 7, install approx. 4,500 ft. 48 in. concrete pressure pipe along Stickney Ave. from Elbon St. to Matzinger Rd. $1,800,000. Plans deposit $10. George Van Dorp, city water engr. CD 10/8/51.

BUILDINGS—BA

▲ **Wis., Watertown**—SCHOOL—BA 6/29—Bd. Educ., Watertown, 1 and 2 story irregular 260x262 ft. concrete, steel, brick, blocks high school addn. $1,200,000. Plans deposit $25. Durrant & Berquist, 666 Loras Blvd., Dubuque, Iowa, archts. CD 10/21.

▲ **Wis., Madison**—STATE OFFICE—BA 7/11—Wisconsin State Pub. Bldg. Corp., State Office Bldg., general construction, Unit No. 3, state office bldg. addn. $4,000,000. Plans deposit $50. Roger C. Kirchhoff, state archt. R. D. Culbertson, state engr. CD 10/26.

HEAVY CONSTRUCTION—LB & CA

▲† **M. J. Boyle & Co.,** 2480 N. Elston St., Chicago, Ill. LB **$4,608,000.** (2 bidders) Lakefront Airport and Bratenahl Nike Sites, Cleveland, Cuyahoga Co., OHIO. U. S. Eng., New Post Office Bldg., Pittsburgh, Pa. Bids May 24. CD 5/16, under LB.

▲ **Robert R. Anderson Co.,** 4550 W. Patterson Ave., Chicago, Ill., LB **$1,038,322.** Section 7-A, part of substructure between Calumet River bridge and Indianapolis Blvd., Calumet Skyway Toll Bridge; CHICAGO, ILL. City, City Hall, Chicago, Ill. DeLeuw Cather Co., 150 N. Wacker Dr., Chicago, Ill., engrs.;
Bethlehem Steel Corp., 400 N. Michigan Ave., Chicago, Ill., LB **$298,800.** fabrication of bridges over 87 St. and Kingston Ave. (Chicago, Ill.);
Arcole Midwest Corp., 3225 Main St., Skokie, Ill., LB **$214,975.** Section 7-B, part of substructure between Calumet River bridge and Indianapolis Blvd. (Chicago, Ill.)

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,
Mich.—**American Bridge Div. U. S. Steel,** 9-255 General Motors Bldg., Detroit 2, Mich. LB **$1,373,153.** furnish, fabricate and erect structural steel spans and furnish, fabricate, erect. structural steel and machinery in spans 3-4-5 for bascule bridge relocation US-31 over Grand River, U B1 of 70-13-6 C1-UN (U 155 28), Ottawa Co.;
Mich.—**Louis Garavaglia,** 24240 Mound Rd., Center Line, Mich. LB **$354,209,** est. $380,000. (6 bidders) rein.-con., steel bridge on French Rd. over Edsel Ford Expressway, BUI B72 of ER 22-10 C1-UO (UI 09 16), Wayne Co.;
Mich.—**Gene Fewell,** 930 Ellsmere St. N. E., Grand Rapids, Mich. LB **$79,152,** est. $80,000. (9 bidders) concrete, steel bridge county road over Thornapple River 4 mi. south of Hastings, CS B1 of 8-6-21 C1 (S 900 3), Barry Co. Bids May 23. CD 5/9, 5/16.

▲ **MICHIGAN**—Mackinac Bridge Auth., 698 Prudden Bldg., Lansing,
Bates & Rogers Constr. Corp., 600 W. Jackson St., Chicago, Ill. CA **$2,039,309.** 17,918 ft. paving on deck of Mackinac Bridge, Mackinaw City-St. Ignace. CD 5/23, under LB.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason, Bldg., Lansing,
Mich.—**Denton Constr. Co.,** 20415 Mack Ave., Grosse Pointe, Mich. LB **$2,511,928,** Est. $2,520,000 (18 bidders) c. conc., b. conc. 0.353 mi. US-27, dual c. conc. bit. conc. 12.022 mi. US-27 from Steel St., St. Johns to M-47 (4 bridges incl.), M 19-6 C5 UM, 19-24 C7-Un, etc., Clinton Co.;
Mich.—**Louis Garavaglia,** 24240 Mound Rd., Center Line, Mich. and **Julius Porath & Son Co.,** 432 Lafayette Bldg., Detroit, Mich. LB **$871,822,** est. $920,000 (8 bidders) base course pavement, power and signal facilities on John C. Lodge Expressway from Linwood to Kendall Aves., (BUI 82-128 C23 U) (BUI 97-1-4), Wayne Co.;
Mich.—**Greenfield Constr. Co.,** 16596 Greenfield St., Detroit, Mich. LB **$507,937,** est. $540,000. (9 bidders) 48 in. water main, 36 in. water main in tunnel and water main alterations at Garland St. and St. Jean Ave. on Edsel Ford Expressway, UI 82-69 C21-UO (UI 09-1-4), Wayne Co.;
Mich.—**Cadillac Asphalt Paving Co.,** 12490 Evergreen St., Detroit 28, Mich. LB **$240,078,** est. $250,000. 80 ft. b. conc. surf. 1.92 mi. Michigan Ave. from Wyoming Ave. to Livernois, F 82-92 C1-U (F 245 22) Part I, Wayne Co.;
Mich.—**A. L. Dyer & Sons,** McBrides, Mich. LB **$359,585,** est. $370,000. (11 bidders) 25 ft. aggregate base course prime and double seal on 4.052 mi. relocation M-57 M 25-62 C1-R, Genesee Co. Bids May 23. CD 5/16 and 5/9.

BUILDINGS—LB & CA

▲ **The Carmichael Constr. Co.,** 148 E. Miller Ave., Akron, O. CA Est. **$1,250,000.** OFFICE addn., 80 W. Bowery Bldg., AKRON, O. Burkhardt Consolidated Co., 80 W. Bowery St., Akron, O. CD 12/22.

▲ **Wm. F. Mefford & Son,** 5201 Montgomery Rd., Norwood, O. Own Forces. Est. **$4,700,000.** 285 one story, bsmnt., brick veneer HOMES, on 122 acres, Plainfield and Creek Rds., CINCINNATI, O. Ayers & Graf, 520 Linton St., Cincinnati, O., engrs. Awarded May 24.

▲ **Swango & Sons Constr. Co.,** 258 E. Stroop Rd., Dayton, O. Owner Builds. **$1,250,000.** SHOPPING CENTER, incl. 14 stores, Stroop and Shroyer Rds., KETTERING, O. CD 5/31/55.

▲ **H. S. Graham Builders,** 431 Connecticut St., Gary, Ind. Own Forces. **$3,500,000.** 180 HOMES, Glenn Park Terrace Subdivision, GARY, IND.

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▲ **Black & Anderson,** 428 N. Michigan Ave., Chicago, Ill., CA **$2,923,268,** HOSPITAL addn., SOUTH BEND, IND. St. Joseph Hospital, 401 N. Notre Dame Ave., South Bend, Ind. CD 5/22, under LB.

▲† **O. W. Burke Co.,** 1032 Fisher Bldg., Detroit, Mich. CA **$1,547,731.** general constr. National Guard ARMORY, Eighth Mile Rd., DETROIT, MICH: U. S. Eng., 600 E. Jefferson Ave., Detroit, Mich. Bids Apr. 24, CD 4/16;
Lloyd S. Thornton Co., Inc., 1675 Maple St., Troy, Mich. CA **$397,407.** mechanical work (Detroit, Mich.).

WEST OF MISSISSIPPI

BUILDINGS—BA

▲ **N. D., Minot**—HOSPITAL—BA 6/20—Trinity Hospital, H. Lahaug, mgr., Minot, 2 or 3 story hospital addn. $1,500,000. Ellerbe & Co., 505 First National Bank Bldg., St. Paul, Minn., archts. CD 5/4.

▲ **Minn., Rochester**—SCHOOL—BA 6/26—Bd. Educ., R. W. Dorsett, bus. mgr., 2 story, part bsmnt., Senior High School. $4,000,000. Extended date. Ellerbe & Co., E. 505 First National Bank Bldg., St. Paul, archts. CD 5/16.

BUILDINGS—SLC

▲ **Minn., Minneapolis**—HOSPITAL—Fairview Hospital, C. Platou, admin., 2312 S. Sixth St., soon lets contract, 4 story hospital addn. $1,250,000. Ellerbe & Co., E. 505 First National Bank Bldg., St. Paul, archts. CD 4/25.

HEAVY CONSTRUCTION—LB & CA

▲ **KANSAS**—State Hy. Comn., Kansas City,
J. A. Tobin Constr. Co., 3701 Rainbow Blvd., Kansas City, Kan. CA **$827,428.** (3 bidders) c. conc. 1.726 mi. Proj. 40-105 IN 080-1 (1), Wyandotte Co.; CA **$1,198,694.** (5 bidders) grading 1.726 mi., Proj. 40-105-IN 080-1 (1), Wyandotte Co. Bids May 22. CD 5/11.

▲ **TEXAS**—Texas Turnpike Auth., 214 First Federal Savings Bldg., Austin, Zone 1,
T. L. James & Co. and W. R. Aldrich & Co., P. O. Box 1751, Baton Rouge, La., CA **$1,666,251.** paving 5.555 mi. from proposed connection with Fort Worth Freeway to approx. 0.5 mi. west of Ederville Rd. Cont. D-FW 49, Tarrant Co. Bids May 15, awarded May 24. CD 5/21, under LB.

BUILDINGS—LB & CA

▲ **Robert Berkley,** 8015 Forsyth Blvd., Clayton 24, Mo. Owner Builds. **$1,500,000.** 200 RESIDENCES in Lake Park subdivision adjacent to Heege and MacKenzie Rds., AFFTON (ST. LOUIS 23 P. O.), MO.

▲ **H. A. Schulenberg Constr. Co.,** 7925 Clayton Rd., St. Louis 24, Mo. Owner Builds. **$1,500,000.** 200 RESIDENCES in New Lake Park subdivision development on 89 acre tract at MacKenzie and Heege Rds., AFFTON (ST. LOUIS 23 P. O.), MO.

▲ **Hardesty-Johnson Builders, Inc.,** 7230 Forsyth Blvd., Clayton 24, Mo. Owner Builds. **$3,000,000.** approx. 500 RESIDENCES and 20 acre SHOPPING CENTER in 123 acre Lynn Haven subdivision on Hy. 140 north of Hy. 66 by-pass, incl. sewers 3 mi. 32 wide streets, HAZELWOOD (ST. LOUIS 21 P.O.), MO.

▲ **Sam. Brown & Sons Realty & Constr. Co.,** 8230 Forsyth Blvd., Clayton 24, Mo. Owner Builds. **$2,500,000.** 11 story OFFICE, containing STORES first floor, on site 200x436 ft. in 4000 block Lindell Blvd., ST. LOUIS, MO. Edward Francis Gordon, 8230 Forsyth Blvd., Clayton 24, Mo., archt.

▲ **John Q. Hammons & Carroll Ellis,** McDaniel Bldg., Springfield, Mo. Owner Builds. **$2,500,000.** GLEN ISLE CENTER, incl. 120 sq. ft. floor space, 1500 S. Glenstone St., SPRINGFIELD, MO. J. W. Amspacher, McDaniel Bldg., Springfield, Mo., archt.

▲ **The Fluor Corp. Ltd.,** 2500 Atlantic St., Los Angeles, Calif., CA Est. about **$16,000,000.** design, engineering and construction, butadiene PLANT near ODESSA, TEX. Odessa Butadiene Co., Odessa, Tex.

▲ **Mead & Mount Constr. Co.,** 1560 Denver Club Bldg., Denver, Colo. CA, **$1,429,450.** general contract two 3-story women's DORMITORIES, 2 story DINING HALL addn., GREELEY, COLO. Colorado State College of Educ., Campus, Greeley, Colo. Apr. 24. CD 5/2, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

▲† **Calif., Muroc**—ENGINE TEST FACILITY—BA 6/25—U. S. Eng., 751 S. Figueroa St., Los Angeles, engine test facility, Edwards Air Force Base, ENG-04-353-56-113. $3,000,000. CD 8/30/54.

BUILDINGS—BA

▲ **Wash., Seattle**—SCHOOL—BA 6/26—School Dist. No. 1, 815 4 Ave. N., three Southwest Seattle Senior High School buildings, W. Thistle St. and 27 Ave. S.W. $2,000,000. Plans deposit $50. Naramore, Bain, Brady & Johanson, 904 7 Ave., Zone 1, archts. CD 3/15/54.

▲ **Wash., Tacoma**—COUNTY-CITY—BA 7/10—Pierce Co. County Court House, Tacoma, new county-city bldg. $5,000,000. CD 3/28, under LB.

HEAVY CONSTRUCTION—LB & CA

▲ **United States Steel Corp., American Bridge Div.,** 309 S. W. 6 Ave., Portland, Ore. CA **$2,270,443.** superstructure for Morrison St. Bridge, PORTLAND, ORE. Multnomah Co., Court House, Portland, Ore. CD 5/3, under LB.

▲† **Oberg Constr. Corp.,** 401 W. Florence Ave., Inglewood, Calif., CA **$1,211,657,** Eaton Wash channel, Huntington Dr. to Encinita Ave., Temple City, Los

(Continued on page 152)

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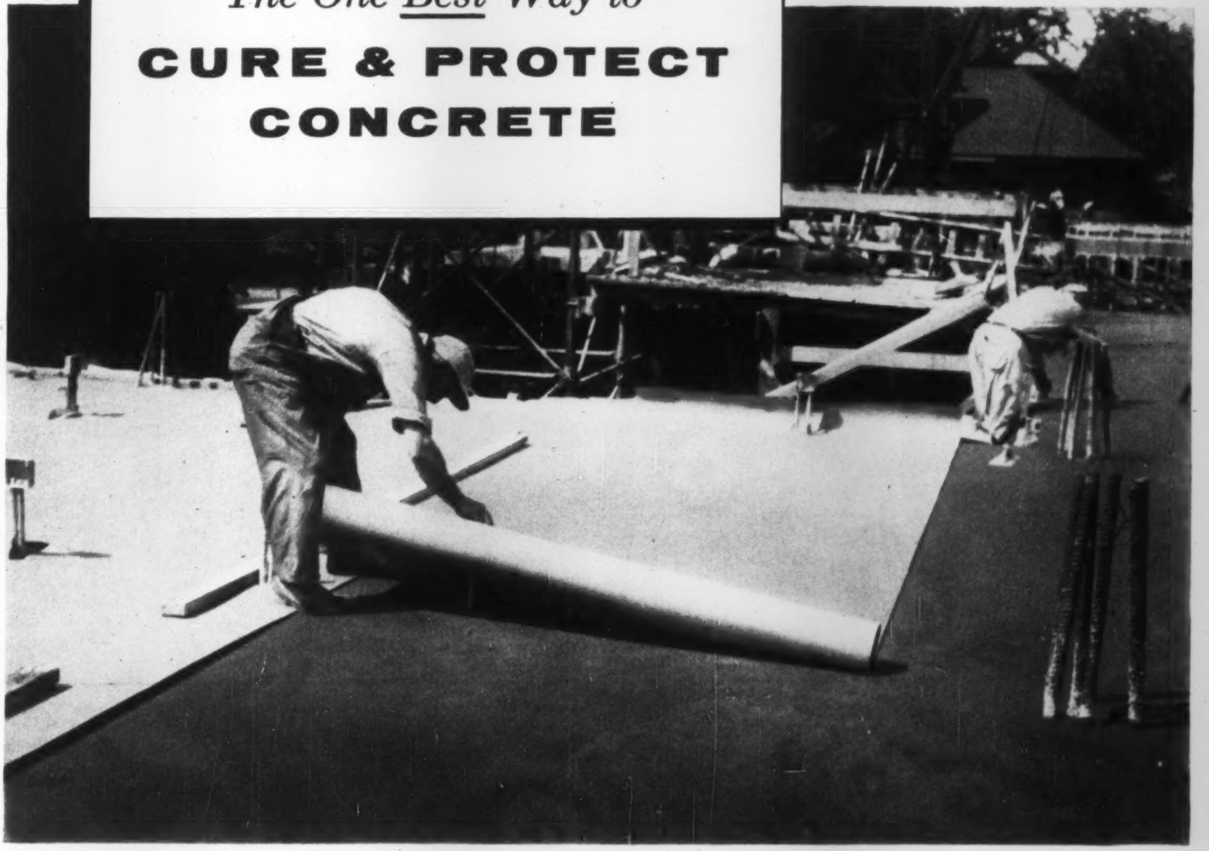

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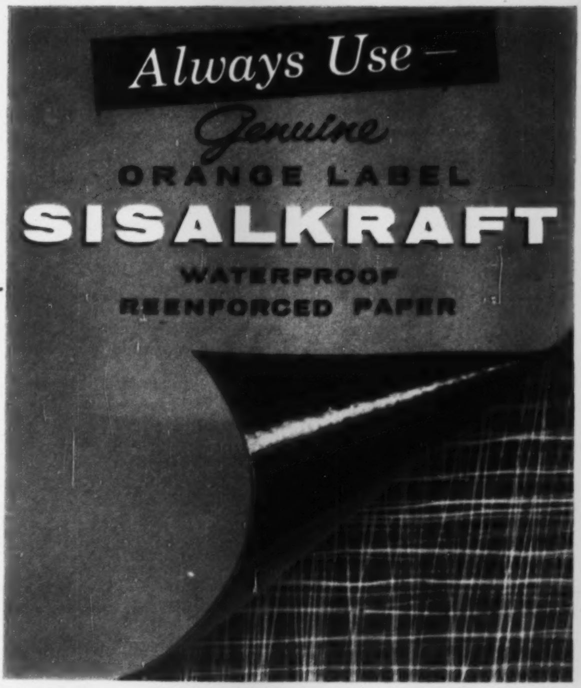

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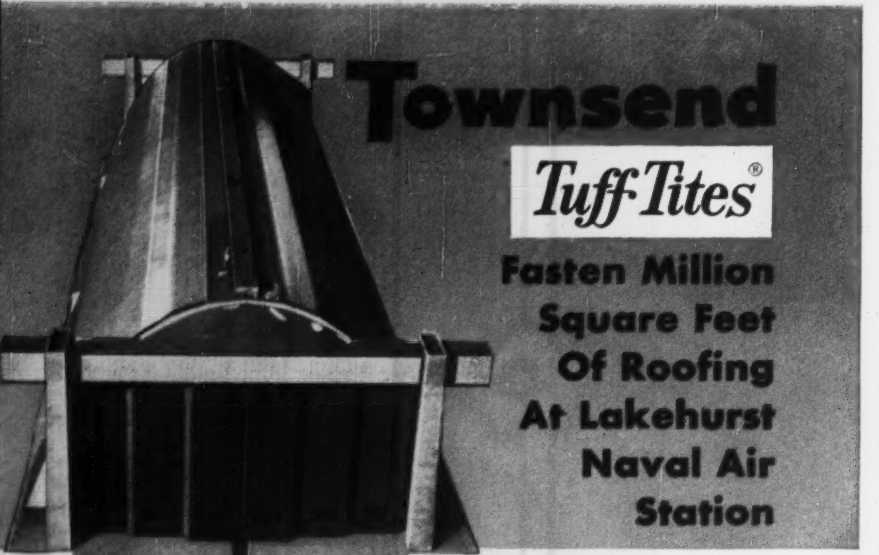

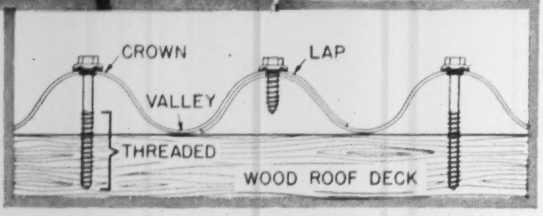

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(Continued from page 150)

Angeles Co., CIVENG-04-353-56-44, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 8. CD 5/10, under LB.

▲† **T. M. Page Corp. & R.C.R. Corp.**, 145 West Duarte Road, Monrovia, Calif., CA **$1,850,584**, San Antonio and Chico Creek Channels, Santa Ana River Basin, Los Angeles Co., CIVENG-04-3553-56-47, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 2, CD 5/4, under LB.

▲† **Johnson, Drake & Piper Constr. Co.**, 9009 San Leandro St., Oakland, Calif., LB **$1,258,948** (5 bidders) addnl. storage facilities, ENG-57-602, HAMILTON AIR FORCE BASE, CALIF. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. CD 9/9.

▲† **L. C. Anderson Co. & Oliver Constr. Co.**, 3040 Hancock St., San Diego, Calif., LB **$1,652,034** (1 bidder) Naval facility and Project Aircraft Maintenance Bldg., Spec. 4108/56, SAN NICHOLAS ISLAND, CALIF. Eleventh Naval Dist., San Diego, Calif. Bids May 24. CD 5/2

BUILDINGS—LB & CA

▲ **Morley Bldg. Co.**, 7700 Sunset Blvd., Los Angeles, Calif., LB **$2,061,000.** West Covina High SCHOOL, West Covina, COVINA, CALIF. Covina Union High School Dist., Covina, Calif. Bids May 23. CD 5/1.

▲ **Edward W. Burgar, Inc.**, 909 "D" St., San Rafael, Calif., CA **$4,500,000.** HOTEL, MILL VALLEY, CALIF. Syndicate, c/o James Behr, 425 Miller Ave., Mill Valley and Walter Hartman, 131 E. 66 St., New York, N. Y. CD 5/29.

▲ **Barrett Constr Co.**, 1800 Evans Ave., San Francisco, Calif., LB **$1,391,000** (7 bidders) Sheriffs OFFICES and COUNTY JAIL, SAN JOSE, CALIF. Santa Clara Co., Court House, San Jose, Calif. Bids May 24. CD 4/27.

▲ **Haas & Haynie Constr. Co.**, 275 Pine St., San Francisco, Calif., CA **$1,857,300.** PRODUCTS ENGINEERING AND ADVANCE RESEARCH BLDG., near SAN RAFAEL, CALIF. International Business Machine, 99 Notre Dame Ave., San Jose, Calif. John Bolles, Pier 5, San Francisco, Calif., archt.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
June 12 British Columbia

BUILDINGS—BA

▲ **Que., Thetford Mines**—PROCESSING PLANT—Bids Asked—National Asbestos Mines Ltd., Thetford Mines, asbestos fibre processing plant, $5,000,000. Paul H. Lapointe, 3534 Cote des Nieges Rd., Montreal, Que., archt. Giffels & Vallet of Canada Ltd., 65 Elliott St. E., Windsor, Ont., engrs. CD 5/10.

BUILDINGS—SLC

▲ **Que., Pont Rouge**—PLANT—Building Products Ltd., Pont Rouge, soon lets contract 1 story, 135x500 ft. steel, concrete block plant addn. $1,500,000. Pierre Rinfret, 1134 St. Louis Rd., Sillery, archt. CD 3/21.

▲ **Que., St. Jerome**—PLANT—Rolland Paper Co. Ltd., St. Jerome, soon lets contract 1 story, 20,000 sq. ft. rein.-con., structural steel, masonry paper plant addn. $4,750,000. Charles T. Main, 20 Federal St., Boston, Mass., U.S.A., engr. CD 12/23.

HEAVY CONSTRUCTION—LB & CA

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria,

Lakelse Constr. Co., Terrace, B. C., LB **$1,501,058.** Proj. 693, 15.43 mi. Terrace-Kitimat Hy., Kitimat River-Kitimat Section. Bids May 17. CD 5/7.

▲ **Bibblee Constr. Co. Ltd.**, Banks St., Ottawa, Ont., CA **$1,194,699** (2 bidders) road work 2-lane, Carling Ave. from Bronson to Kirkwood Aves., OTTAWA, ONT. City, City Hall, Ottawa, Ont. Bids May 22. CD 5/2.

▲ **Spino Constr. Ltd.**, 200 Sauve St. W., Montreal, Que., CA **$2,256,766,** collector sewer in Mercier Ward, MONTREAL, QUE. City, City Hall, Montreal, Que. Awarded May 18. CD 5/4, under LB.

HEAVY CONSTRUCTION—LB & CA

▲ **Frid Constr. Co. Ltd.**, 605 James St. N., Hamilton, Ont., CA **$2,000,000-$3,000,000.** distribution transformer PLANT, Clark Sideroad area, LONDON, ONT. Canadian Westinghouse Co. Ltd., 286 Sanford Ave. N., Hamilton, Ont. Giffels & Vallet of Canada, Ltd., 65 Elliott St. E., Windsor, Ont., engrs. CD 5/29.

▲ **Domaine Estria**, 630 Dorchester St. W., Montreal, Que. Owner Builds, **$2,000,000,** HOUSING DEVELOPMENT, incl. 222 low rental apartments, MONTREAL, QUE. Gabriel Jarry, 7271 Querbes Ave., Montreal, Que., archt.

ALASKA

HEAVY CONSTRUCTION—LB & CA

▲ **Manson Constr. & Eng. Co. & Osberg Constr. Co.**, 1132 N. 128 St., Seattle 33, Wash., LB **$1,706,500** est. $1,596,158, White Alice communication stations at Fort Yukon and Kotzebue, Inv. 56-52, ALASKA U. S. Eng., 4735 E. Marginal Way, Seattle, Wash. CD 5/24. CD 5/11.

LATIN AMERICA

BUILDINGS—BA

▲ **Argentina, Buenos Aires**—HOUSES—Bids Asked—National Mortgage Bank (Banco Hipotecario de la Nacion) Buenos Aires, 702 low cost houses. $3,300,000.

(Proposal Advertisements see p. 165 to 167)

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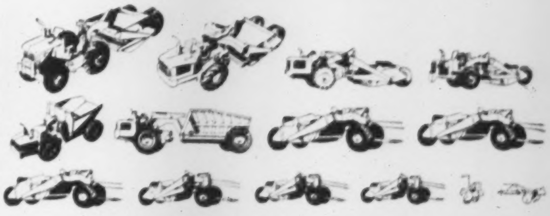
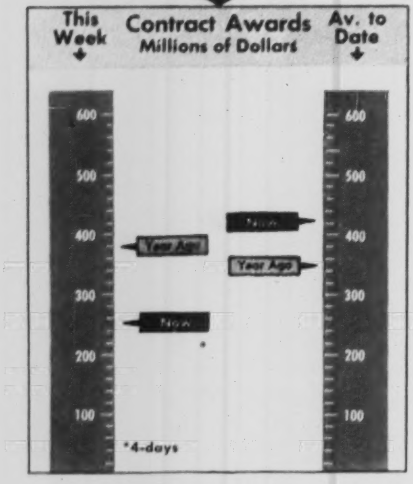


tin TL-107. City Zone State

Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 23 wks 1956	Chge %
	$ millions		
Federal	$28.7	$800.0	+4
State and Municipal	105.5	2,778.1	+22
Total Public	134.2	3,578.1	+18
Total Private	116.0	6,413.8	+23
U. S. Total	$250.2	$9,991.9	+21
By Type of Work			
Waterworks	$2.6	$128.3	+11
Sewerage	3.8	272.2	+58
Bridges	18.5	256.4	+28
Highways	47.8	1,045.3	+16
Earthwork, Waterways	6.5	299.9	+21
Buildings:			
Public, Excl. Hosg.	31.1	874.3	+22
Public Housing	4.9	172.9	+34
Private Housing	56.9	2,682.4	−13
Commercial	23.8	865.8	+22
Industrial	32.8	2,551.4	+133
Unclassified	21.5	838.0	−5
U. S. Total	$250.2	$9,991.9	+21

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

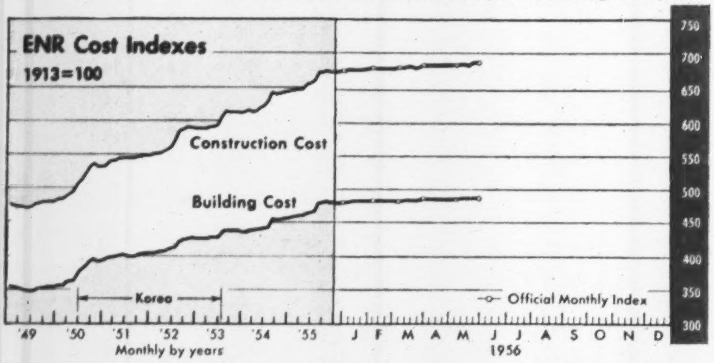
	Week of May 31	Cum. 22 wks 1956	Chge '55-'56 %
	$ millions		
Corporate Securities	$65.6	$1,869.5	+24
State and Municipal:			
All Except Housing	202.9	2,027.4	+16
Housing	...	20.3	−56
Federal Loans	1.0	63.4	+57
Federal Aid	...	...	−100
Total Nonfederal	$269.5	$3,980.6	+16
Federal Appropriations:			
In U. S.	$...	$34.4	−42
Outside U. S.	...	...	...
Total New Capital	$269.5	$4,015.1	+15

Cost Indexes as of Now

ENR INDEXES (1913–100), 20-cities' average	May 31 1956	% Change from May 3, 1956	% Change from June 2, 1955
Construction Cost	692.13*	+0.5	+5.5
Building Cost	488.70*	+0.3	+5.1

*Official Monthly Index for June.

To convert above indexes to 1926 = 100: Divide Construction Cost by 2,030; Building Cost by 1,845.
1949 = 100: Divide Construction Cost by 4,770; Building Cost by 3,518.



WAGE RATES, 20-cities' average	May 31 1956	% Change from May 3, 1956	% Change from June 2, 1955
Common	$2.168	+0.9	+5.3
Skilled (average 3 trades)	3.366	+0.7	+4.3
Bricklayers	3.644	+0.9	+4.4
Structural Ironworkers	3.326	+0.3	+3.6
Carpenters	3.127	+0.9	+4.8

MATERIAL PRICES, 20-cities' average	May 31 1956	% Change from May 3, 1956	% Change from June 2, 1955
Structural Steel (average 3 mills), per cwt	$4.600	0	+8.2
Lumber, 2x4 Fir, per M fbm	122.444	−0.3	+3.1
Lumber, 2x4 Pine, per M fbm	103.866	−0.3	+5.0
Cement, bulk, per bbl	3.710	+0.3	+4.5
Sand, per ton	2.422	−0.2	+3.2
Ready-mixed concrete, per cu yd	13.155	+0.02	+5.4

ENR INDEX REVIEW

	Construction Cost		Building Cost		Volume	
	1913 = 100	1949 = 100	1913 = 100	1949 = 100	1913 = 100	1949 = 100
1955						
June	655.96	137.51	464.82	132.13	633	183
July	660.09	138.38	467.52	132.90	699	202
Aug.	672.24	140.92	478.03	135.89	508	147
Sept.	672.74	141.03	479.15	136.20	576	166
Oct.	673.89	141.27	479.99	136.44	628	182
Nov.	673.20	141.13	479.30	136.25	561	162
Dec.	673.13	141.11	478.70	136.08	544	157
1955 Average	**659.72**	**138.31**	**468.80**	**133.33**	**600**	**173**
1956						
Jan.	676.36	141.79	480.48	136.58	645	186
Feb.	680.21	142.59	483.08	137.32	736	213
Mar.	680.20	142.59	483.14	137.34	786	227
Apr.	683.28	143.24	485.56	138.02	764	221
May	688.43	144.32	487.36	138.54	684	198
June	692.13	145.09	488.70	138.92	...	...

MATERIAL SHORTAGES

- **Aluminum building sheets:** Boston, Denver, Detroit, Kansas City, New York, St. Louis, Montreal, Toronto.
- **Aluminum corrugated roofing:** Denver, Detroit, Kansas City, New York, St. Louis, Montreal.
- **Structural steel:** Birmingham, Boston, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Minneapolis, Philadelphia, Seattle, Montreal, Toronto.
- **Reinforcing bars:** Birmingham, Chicago, Denver, Detroit, Philadelphia, Montreal, Toronto.
- **Sheetpiling steel:** Chicago, Dallas, Denver, Detroit, Los Angeles, Minneapolis, Toronto.
- **Cast iron pipe:** Boston, Chicago, Kansas City.

For ENR cost indexes for preceding years see insert chart ENR Sept. 29, '55 Extra copies 50 cents

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Business and Finance

With public works up, but private construction off . . .

May Awards Nearly Match 1955 Record

The roller coaster behavior of contract awards for private work prevented May from matching the record for the month, set last year.

Although private construction started the month—and ended it—with weeks that topped the $500-million mark, private awards hit the skids during the weeks in between.

A 19% decline from April's level gave private work its lowest rate since January, but this was partly offset in the totals by a seasonal increase in state and municipal work, which set a May record of $128 million per week, and a sharp rise in federal awards, up 53% over April to an average weekly rate of $38.4 million.

• More Than $2.1 Billion

The total for all types of heavy construction awards, as reported by ENR, was more than $2.1 billion. This was within 2% of the May 1955 record for the month.

Some decline in industrial building and a drop in mass housing were key factors in the lower volume of private construction last month. However, even though industrial building was below the March and April rates, it was 87% ahead of May 1955.

With more than $2.5 billion in awards for the first five months of this year, industrial building is 139% ahead of the comparable 1955 period —and it continues to be a potent force in the boom.

Private mass housing last month dropped to a weekly average of $92.6 million, the lowest so far this year, and 43% under May 1955, which was the second highest month in history for dollar value of housing awards.

Commercial building reversed its downtrend and turned up with a 13% rise over April. But, the volume was slightly below the May 1955 average and this type of construction, which was 30% ahead of 1955 as of the end of April, is now only 24% ahead.

Highway contracts triggered the boom in state and municipal awards, posting a new record for the month of May. Awards averaged $52 million a week. Bridges dipped to a weekly average of $8.8 million, but both highways and bridges are running well ahead of last year.

Sewerage contracts last month went up to a weekly average of $11.6 million. Awards for this type of work have been strong for April and May and the $273-million cumulative volume for the first five months is a whopping 64% above the same months of 1955. Sewerage contracts are expected to set a new record this year, outpacing the previous high, ($431 million in 1953) by a substantial margin.

• Waterworks Awards Weak

Waterworks awards were down last month. But the total for the first five months is 19% over 1955 and the category definitely seems slated for a new record this year.

An upsurge in earthwork and waterways business in May helped to increase the margin for this category to 36% over 1955 for the first five months.

Public buildings, other than public housing, reported an average of $45 million a week during May. For the first five months, this work is 23% ahead of 1955.

The erratic pattern of May awards —with some categories up and others down—still contributed a large volume. May awards pushed the grand total for the year to date to a new all-time high of $9,742 million—24% over last year's record high.

(Continued on page 159)

ENGINEERING CONSTRUCTION CONTRACTS—MAY 1956

ENGINEERING NEWS-RECORD *reports continental U. S. Construction projects of the following minimum costs—Waterworks, excavation, drainage and irrigation, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000*

Five Weeks—Thousands of Dollars (000 Omitted)

	May, 1956							U. S. Cumulative Five Months		% Change	Canada
	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Far West	Total U. S.	1956 (22 weeks)	1955 (21 weeks)	'55 to '56 Av.Wk.	May 1956
Public Works											
Waterworks	1,539	1,959	3,323	3,381	10,059	5,149	**25,410**	**125,671**	103,548	+16	9,962
Sewerage	7,340	9,994	10,102	9,809	8,988	11,992	**58,225**	**273,478**	158,975	+64	8,036
Bridges	4,003	11,635	7,858	8,103	7,367	3,520	**42,486**	**235,245**	180,375	+24	2,487
Earthwork and waterways	2,907	31,334	9,347	1,838	11,612	21,364	**78,402**	**293,411**	206,240	+36	8,162
Streets and roads	7,142	51,676	39,779	51,635	72,708	35,050	**257,990**	**997,471**	793,062	+20	23,132
Public buildings, residential	362	4,772	4,819	16,731	7,730	1,447	**35,861**	**167,893**	114,172	+40	7,767
Other public buildings	10,264	49,223	17,057	49,425	49,575	48,514	**224,058**	**843,194**	665,033	+21	18,257
Unclassified	8,226	27,455	29,658	8,038	23,254	13,183	**109,814**	**507,544**	521,512	−7	8,355
Total public	**41,783**	**188,048**	**121,943**	**148,960**	**191,293**	**140,219**	**832,246**	**3,443,907**	**2,742,917**	**+20**	**86,158**
Federal government (included in above classifications)	11,318	43,223	32,971	9,807	50,345	44,929	**192,593**	**771,254**	705,735	+ 4	10,143
Private											
Bridges	....	1,798	....	....	75	....	**1,873**	**2,679**	1,625	+58	....
Industrial buildings	26,922	115,851	50,892	203,101	47,494	151,611	**595,871**	**2 518,715**	1,033,899	+133	60,285
Mass housing	14,003	182,533	16,871	145,674	79,729	25,103	**463,913**	**2,625,480**	2,792,203	−10	19,263
Commercial buildings	11,025	80,227	10,472	26,875	25,076	14,775	**168,450**	**842,066**	654,834	+23	6,639
Unclassified	1,835	13,564	3,815	10,021	26,201	1,981	**57,417**	**308,886**	317,119	−7	11,040
Total private	**53,785**	**393,973**	**82,050**	**385,671**	**178,575**	**193,470**	**1,287,524**	**6,297,826**	**4,799,680**	**+25**	**97,227**
Total Engineering Construction:											
May, 1956—5 weeks	**95,568**	**582,021**	**203,993**	**534,631**	**369,868**	**333,689**	**2,119,770**	....	....	......	**183,385**
April, 1956—4 weeks	79,197	326,819	193,317	505,373	437,262	326,732	**1,868,700**	....	....	......	159,212
May, 1955—4 weeks	92,474	503,495	141,042	396,095	398,965	194,454	**1,726,525**	....	....	......	156,519
Five Months—1956	**543,248**	**2,788,656**	**917,879**	**2,024,035**	**2,102,962**	**1,364,953**	....	**9,741,733**	....	**+23**	**810,375**
Five Months—1955	374,845	2,247,823	814,153	1,631,066	1,652,366	822,344	....	....	7,542,597	......	641,858
% Change '55 to '56 (Av. Wk.)	+38	+18	+8	+18	+22	+58	....	....	....	......	+21

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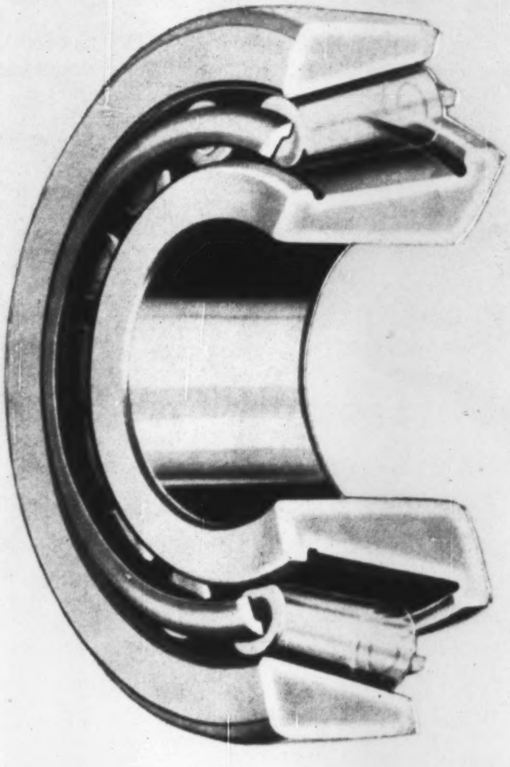

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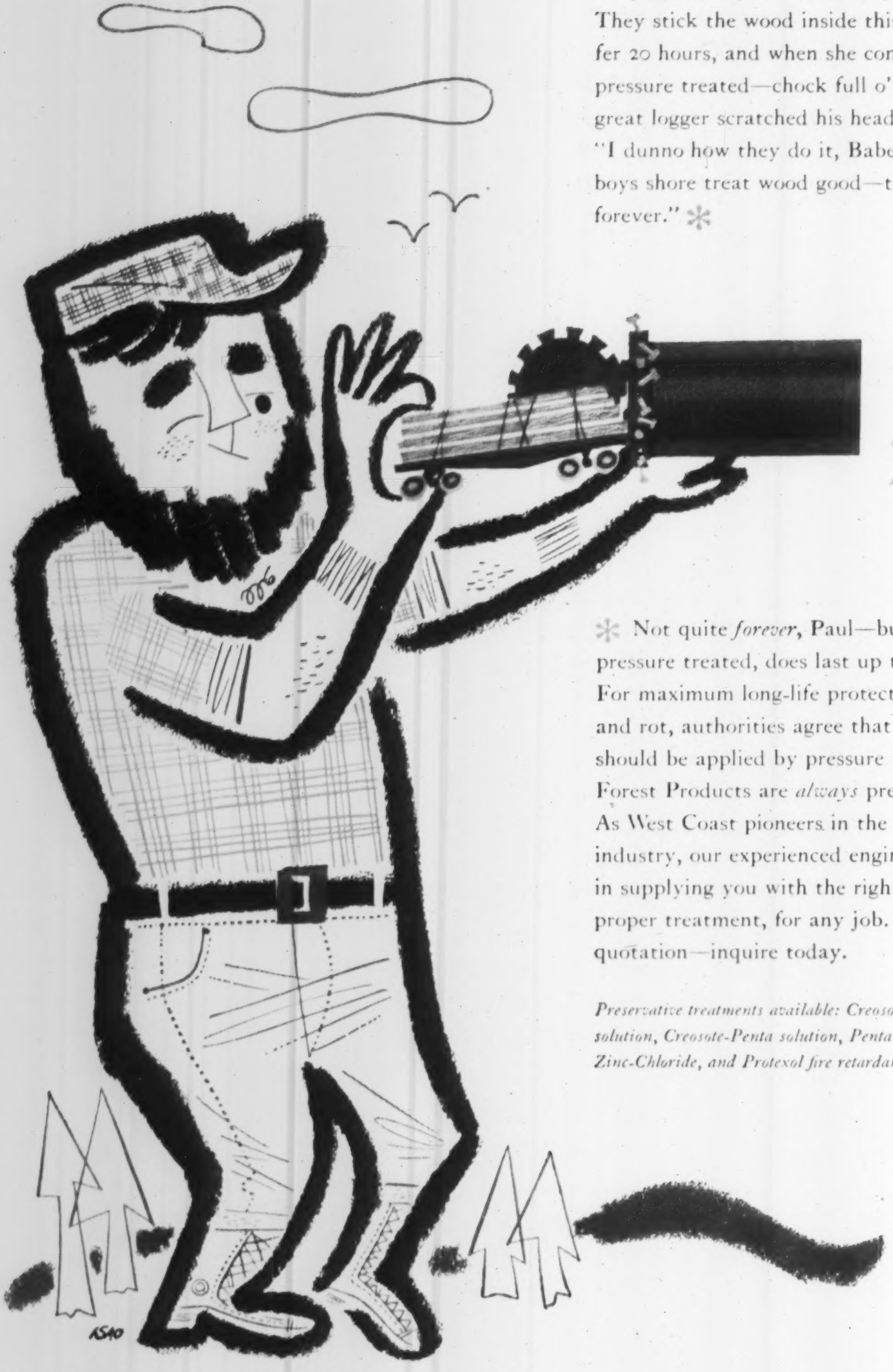

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(Continued from page 156)

To date, every region is ahead of the comparable 1955 period. Three regions—the Middle Atlantic, Middle West and West of the Mississippi—have passed the $2-billion mark in contracts.

Two of these areas, the Middle West and Middle Atlantic, ran up more than $500 million in awards in May. The Middle Atlantic had awards of more than $582 million; the Middle West had a total of $535 million. In both of these regions, industrial building and mass housing contracts bolstered the total, with a big assist from awards for public works.

Industrial building also was a big factor in the Far West which set a May record of $152 million for this type of work. The biggest chunk of this was a $113-million steel plant for Kaiser Steel at Fontana, Calif., part of a drive to build steel facilities close to the growing West Coast markets.

With the sole exception of New England, every region reported public works contracts of more than $120 million in May. The West of the Mississippi region rolled up more than $191 million, largely because of some $73 million in highway contracts and $50 million for public buildings (excluding public housing).

The Middle Atlantic region garnered the next biggest volume of public work ($188 million) with the total including awards of $52 million for highways; $49 million for public buildings (excluding public housing); and $31 million for earthwork and waterways.

Sewerage contracts of $58 million—the second highest total of the year—were divided almost equally among the six regions.

Almost half of the month's waterworks projects were concentrated in the West of the Mississippi region, which has led all other sections in the past two years in volume of waterworks construction.

ENR Cost Indexes Hit New Highs

Wage hikes offset lumber price drop; building costs up 1.7% since January; construction costs up 2.3%

ENR's Building and Construction Cost Indexes this month reached record highs as new wage pacts more than offset a softening of lumber prices in key cities.

Since the first of the year, ENR's Construction Cost Index has spurted 16 points to a record 692 (1913 = 100), while the Building Cost Index has advanced eight points to a new high of 489 (1913 = 100).

The consistent climb in the index means that construction costs went up 2.3% just from January to June, while building costs rose 1.7% during the same period.

Six of the twenty major cities included in the ENR survey reported higher construction costs than a month ago, with new wage rates the biggest single factor.

Chicago, Cleveland, Detroit and New Orleans were among those showing the sharpest rise in construction costs. Detroit's index bounced up, for example, because of a 17-cent wage hike for carpenters, 15 cents for bricklayers and 10 cents for common laborers. A 7½-cent boost for the same three groups in New Orleans resulted in a 15 point jump in that city's construction cost index.

Construction costs probably will go still higher in Detroit, New Orleans and Philadelphia as a result of new wage agreements being negotiated in those cities for structural ironworkers.

Five cities reported that construction costs were down from the May peak, mostly because of price cuts for lumber. The five included: Boston, Dallas, Los Angeles, St. Louis and San Francisco.

Building cost indexes have risen less spectacularly in the last month. One reason for this is that wage rates for skilled labor have gone up less—on a percentage basis—than common labor rates.

Seven cities reported higher building costs, including Chicago, Cleveland, Detroit, Los Angeles, Minneapolis, New Orleans and Philadelphia.

Lower building cost were reported by Boston, Dallas, St. Louis and San Francisco.

The less-than-expected seasonal gain in construction activity—particularly housing—is believed responsible for the softening of lumber prices in scattered areas. Douglas fir 2x4s were down $4 per Mftbm in Boston, down $1 in Cleveland, $5 in Minneapolis, $3 in St. Louis and $1 in San Francisco.

The price of pine 2x4s moved up $2 per Mftbm in Boston, but was off $1 in Chicago and Cleveland; $2 in Dallas; and $3 in St. Louis.

Slow Freight Out

West Coast lumbermen lose fight against ICC

An Interstate Commerce Commission order banning the "slow freight" shipment of West Coast lumber to eastern markets was upheld last week by a three-man federal court panel sitting in U. S. District Court in Portland.

Wholesalers and small lumber companies, who had obtained a temporary restraining order April 7 prohibiting ICC from putting its ruling into effect, protested that the controversial Order 910 would upset their traditional marketing practices. They also contended that ICC had acted without proper notice and that the service order would not achieve the intended purpose of easing an impending freight car shortage.

Effect of ICC order is to ban a practice whereby lumber brokers take lumber on consignment from the sawmills (principally Douglas fir mills in Oregon) and ship it eastward—slowly—while seeking a buyer.

Railroads, to some extent, have encouraged this practice—admittedly two or three weeks slower than regular scheduling—because it helps to fill local trains.

The broker, of course, gains from the practice because he has time to find a buyer for the lumber. And, smaller mill operators contend that it is economical to use freight cars as rolling warehouses because the mills do not require large inventory stocks or storage at the mills, and they are able to produce and ship more lumber.

The court heard some of these lumbermen argue that enforcement of Order 910 would force them out of business, that it would destroy them while diverting their business to larger operators who do not follow the "slow freight" procedure.

In its ruling, the court refrained from passing on the wisdom of the ICC order. It held that while Order 910 might not ease the freight car shortage, ICC had authority to issue such an order—and it said that it was not within the court's power to set aside that order regardless of whether or not the power conferred on ICC was wisely or unwisely exercised.

Not all lumbermen opposed the slow freight ban. Opponents were principally smaller operators and wholesalers, while West Coast Lumbermen's Association supported the ICC.

(B&F continued on page 160)

Housing Tax Upheld

Wherry Act projects are subject to local levies

The U. S. Supreme Court has ruled that states have the right to tax privately constructed, privately operated housing projects built on military bases to serve armed forces personnel or their families.

In a 5-4 decision the high court upheld levying of Nebraska state and county personal taxes on the 611-unit project of the Offutt Housing Co., built at Offutt Air Force Base under the 1949 Wherry Military Housing Act.

The builder sought to avoid payment of $10,783 tax on the grounds that federal instrumentalities and federal property are immune from state taxation.

But the court's majority opinion held that Congress had left states free to tax private interests in housing projects located on areas within otherwise "exclusive" federal power by linking the Wherry Act with provisions of the 1907 Military Leasing Act.

The court also held that while the government retains legal title in the buildings, the 75-year lease to Offutt (while the buildings have an estimated useful life of only 35 years) means that the entire worth of the property will be Offutt's—not the government's. On that basis, the court decided that Offutt's tax legitimately was measured by the full value of the buildings and improvements.

Speaking for the dissenters on the court, Justice William O. Douglas said taxation of a housing project by local authorities would increase the cost and hamper the federal program.

Commented Douglas, "The purposes of the Wherry Act are now partially defeated by what we do today."

During arguments in the Offutt case, the government told the court that there are 92 Wherry Act projects at Air Force installations, of which 62 are being taxed under local laws.

Welfare Funds to Be Used To Finance Homebuilding

The long-time urging of such figures as mass homebuilder William Levitt that union welfare funds should be invested in housing, paid off an unexpected dividend last week: The International Ladies Garment Workers Union announced plans to build and finance 1,500 homes in the $10,000 to $12,500 bracket.

David Dubinsky, ILGWU President, said the money—about $15 million—will come from funds of 130 of the union's retirement and health and welfare plans. He expects about 10% of the monies accumulated in each fund to be invested in housing.

The union plans to buy government-insured mortgages and will give VA loans preference over those insured by FHA.

Some construction unions also have shown interest in using pension and welfare funds for housing investments, but tangible results have been slow in coming. Many union funds are limited in their investment portfolios, and in some cases are restricted to purchase of government bonds, or occasionally tax-exempt bonds or "blue chip" stocks.

Hotels Planned

Three Baltimore projects proposed in one month

For the first time in more than a quarter of a century, hotel construction is on the move in Baltimore. Three projects have been announced within the past month.

Largest of the three is a $3.5-million addition to the Sheraton Belvedere Hotel in the northern section of downtown Baltimore. It will be located just south of the existing hotel—directly in the path of a major east-west arterial highway proposed by city planners for the future.

The City Planning Commission had hoped the addition could be built in such a way that the new expressway could run under the hotel annex. However, this scheme would cost the city an estimated $750,000 and relocation of the expressway now seems probable.

The second project planned for the Baltimore area is a $2-million, 140-room hotel to be known as the Towson Inn. This hotel, to be operated by Knott Hotels, will be part of a $10-million development in Towson, a suburb just north of the city.

The third project will be located near Johns Hopkins Hospital in East Baltimore and will be part of a $15 million development on a 25-acre tract cleared under the city's urban renewal program.

• **Hilton Hotel for Detroit**—While Baltimore was getting hotel fever, Detroit had some plans of its own. After a meeting of Detroit civic and business leaders with hotel magnate Conrad Hilton, agreement was reached on plans for construction of a $24-million, 1,999-room Hilton Hotel, to be located directly across the street from the $42-million Civic Center Convention Hall.

• **Cool million**—Meanwhile, the Barbizon-Plaza in New York City also made hotel news with an announcement that it is spending more than $1-million for a high-velocity electronic air-conditioning system—and heating system. The new system was worked out jointly by Trane, Barber-Coleman, Minneapolis-Honeywell and Westinghouse.

Multi-Million Development Planned for Norfolk's Port

The Norfolk, Va., Port Authority is preparing plans for a multi-million-dollar development of general cargo terminals on the downtown waterfront.

The program—to be divided into three construction stages—will provide eight ship berths along 4,000 ft of pier frontage on the Elizabeth River and its eastern branch.

First phase of the proposed development would involve building an 860,000-sq ft general cargo terminal. It would provide 1,050 ft of wharfage within 100 ft of a 40-ft channel on the main Elizabeth River side, and 970 ft on a 30-ft channel on the eastern branch.

The second phase of work, which would await completion of the first, would provide an additional 1,015 ft of pier space. The third stage, viewed as at least 10 years away, would furnish 1,200 more ft.

Business Briefs . . .

• **Payloader pays off**—Production and shipments of "payloader" tractor-shovels, manufactured by Frank G. Hough, a wholly-owned subsidiary of International Harvester, topped last year's record pace by 50% during the six months of the company's current fiscal year. With their backlog now up to "new record proportions," the company is engaged in an expansion program that will boost present plant facilities by 20%.

• **Equipment price index up**—Construction machinery and equipment prices pushed up again in April, setting a new high for the post-war period, according to the overall wholesale price index of the Bureau of Labor Statistics. Tractors, in particular, carried higher price tags, up an average of 1.5% for the month and up 9.5% for the nine months ending in April.

There's only one GYRO-FLO

GYRO-FLO Compressors and I-R Wagon Drills on a throughway construction job. More compressors and drills on another section of same highway are shown below.

EVER SINCE 1950, when the sensational GYRO-FLO portable rotary compressor was first introduced, there has developed an ever-growing trend to rotary design.

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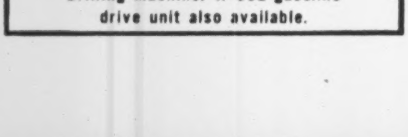

H-600 Air Motor for use with C-1 Drilling Machine. H-602 gasoline drive unit also available.

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The National Labor Relations Board takes a look at . . .

Baltimore's Effort to Adopt the Chicago Plan

Organization of the unorganized in the construction industry has run afoul of federal labor law—at least temporarily—in Baltimore, Md., where the launching of the Chicago plan last year looked like a stabilizing factor in local labor relations as well as an opening wedge in a membership drive for the entire South.

In an intermediate report, National Labor Relations Board trial examiner Alfred P. Wheatley has found the Baltimore Building and Construction Trades Council legally responsible for a secondary boycott conducted by some of its affiliates.

The Baltimore version of the Chicago plan, conceived as a means of ending the labor strife that flowed from putting union and nonunion construction workers on the same job, was directed primarily at unionization of open-shop contractors. It embraced use of a standard agreement which set up the machinery for elimination of strikes and work stoppages and was an inducement to union-shop subcontractors not to work for open-shop generals (ENR Nov. 10, 1955, p. 82).

In the process of putting the plan into effect, three of the locals struck Selby-Battersby & Company, a subcontractor that wouldn't sign the agreement.

Although the council played no active role in the launching of the Chicago plan beyond its initiation, Wheatley considered the union activities a joint venture, thus pulling the council into the group on whom liability for the boycott could be pinned. The council is expected to file exceptions to Wheatley's report this week, and the case will then go to the NLRB for decision.

• Some Bigger Problems

While the results so far may be welcome news to open-shop contractors, they add to the legal difficulties encountered by union-shop contractors and labor groups that seek, as they did in Baltimore, to standardize and stabilize their labor relations. They further hamstrung construction labor in its effort to organize, give added substance to the changes in the Taft-Hartley Act sought by the building trades, and bolster the arguments used by the AFL-CIO Building and Construction Trades Department in its jurisdictional conflict with industrial unions (ENR May 24, p. 107).

The case also involves the validity and practical effectiveness of "hot cargo" clauses, on which the NLRB is already divided, and entails the expenditure of substantial sums on litigation that may still fail to answer some of the fundamental questions raised in the application of the Taft-Hartley Act to the construction industry.

In some respects, the case has already become academic because the standard agreement has since been replaced by one of a different color.

• The Story

Early last year, officials of the AFL-CIO Building Trades Department, of some of its international affiliates and of the Baltimore Council helped to organize the local meetings that led to formation of the Baltimore labor-management Joint Conference Board and the standard agreement. When the Selby-Battersby strike occurred, unfair labor charges, based on violation of the secondary boycott provisions of the Taft-Hartley Act, were filed against the striking locals, their internationals and the Baltimore Council. Later, the unions made a settlement while the case was continued.

Earlier, the council had tried, without success, to breach the defenses of open-shop contractors. In one instance, its picketing of open-shop general contractors ended in the Stover Steel Case, where the NLRB found an illegal secondary boycott because the picketing wasn't limited to the primary employer and made "helpless victims" of the subs on the jobs. It's against this background that Wheatley considered the two-fold question of the legality of the strike and the council's responsibility.

The trial examiner concluded that the strike had the multiple objective of forcing Selby-Battersby to sign the agreement and to cease doing business with open-shop contractors. He also found that some union members were given the choice of conducting the strike or losing their union membership. Accordingly, he found the strike violated the secondary boycott provisions of the Taft-Hartley Act in three respects:

- Selby employees were induced to strike to force Selby to cease doing business with open-shop contractors [Sec. 8 (b) 4(a)].
- The strike was an attempt to force open-shop general contractors to violate the legal rights of their employees by encouraging union membership [Sec. 8 (b) (2)].
- The striking employees were forced to strike in violation of their legal right to refrain from doing so if they wanted to [Sec. 8 (b) 1 (a)].

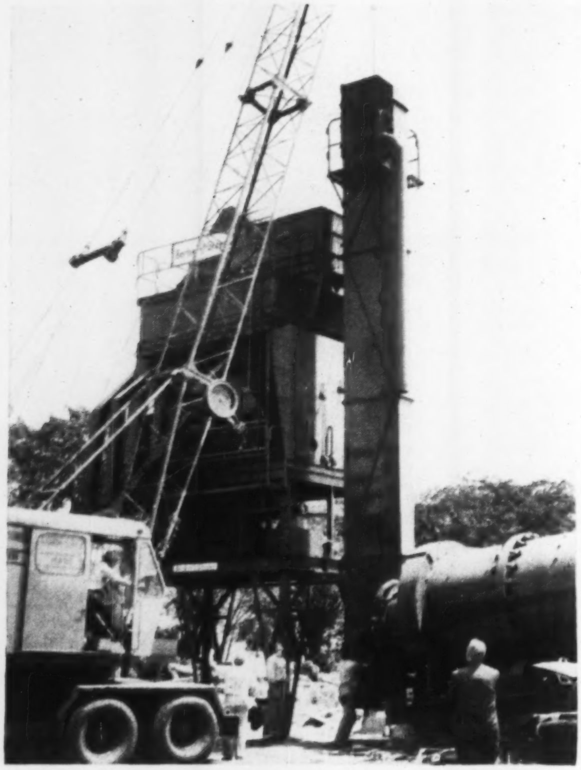
The strike and the inducement to strike were considered by Wheatley—not as isolated instances—but as part of the general pattern of the council's efforts to organize open-shop contractors. Despite the lack of any evidence that the council had participated in or financed the formulation of the standard agreement or had engineered the strike, he viewed the whole affair as a joint venture, in which the council was one of the participants and thus responsible under common law.

• Hot Cargo?

In rather futilely ruling that Selby's employees had a right to strike to compel Selby to stop working his union men alongside nonunion men of general contractors, Wheatley, however, indicated that the controversial clause in the standard agreement was not in itself invalid. The clause is like a valid "hot cargo" clause that gets a union into trouble only when it tries to do something with or about it—like pulling a strike to enforce it.

But since the Selby case arose, the standard agreement, which was before Wheatley, has been scrapped and a new one has taken its place. It's still directed at peaceful adjustment of labor disputes through arbitration, elimination of work stoppages, uniform conditions and stable labor relations, but contains a significant change. Instead of saying that union men won't be required to work with nonunion construction workers or on jobs of open-shop contractors, the agreement now states this in terms of a condition: A contractor signing the agreement will be supplied with union workmen only if the contractor deals exclusively with union-shop contractors.

Bayer & Mingalla's first BatchOmatic Plant operated only a few months when the need for a second plant arose . . .



Having had actual experience with the many exclusive principles, the choice was easy. Here is their second BatchOmatic being erected.

New England contractor buys second Barber-Greene Batch Plant within a year

Experience with the fast, easy erection, automatic operation and unique versatility is what sold B & M Crushed Stone its second Barber-Greene BatchOmatic within one year. In fact, these new operating advantages are selling all three (2000-, 4000- and 6000-pound) B-G Batch Plants to contractors all over the United States and Canada.

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OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.10 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division,
Engineering News-Record
330 West 42nd Street
New York 36, N. Y.

Bids: June 28, 1956

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 28th day of June 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. NICKERSON, District Engineer, 353 Broadway, Albany, N. Y.						
Rensselaer (Route 153)	FASS 56-5	West San Lake-Poestenkill-Cropseyville, Pt. 2 Proj. No. S486(1)	2.16	Bit. Mac. Pen. Meth., Ty. 1=2.04 Mi.; Asp. Conc. Opt.=0.02 Mi.; Misc. Work=0.10 Mi.	$15,000 Plans $10	$267,000
Saratoga (Route 197)	FARC 56-42	Reynolds Corners-Fort Edward, S.H. 1748 Proj. No. S401(1)	0.76	Asp. Conc. Opt.	$9,000 Plans $10	167,000
DISTRICT No. 3, WM. ROBINSON, District Engineer, 301 E. Water St., Syracuse, N. Y.						
Onondaga (Route 57)	FAC 56-1	City of Syracuse: Oswego Boulevard Proj. No. IN463(10)	1.44	Demolition	$2,800 Plans $10	50,000
Onondaga (Route 298)	FARC 56-47 FASH 56-3	Syracuse-Bridgeport, Pt. 1, S.H. 672; Syracuse-Bridgeport, S.H. 672A; Syracuse-Bridgeport, Pt. 3 (Seq. No. 298-1-5). Proj. No. U-UG994(5)	2.70 (2.11 Acc.)	9" Cem. Conc. Pavt.; 2 at 37' Var. Wide=3.59 Mi.; Asp. Conc. Ty. 2A=1.22 Mi.; R.C. Box Culv. Br. 25'; R.R. Sep. I-Beam 103.7'	$130,000 Plans $25	2,350,000
Onondaga and Oswego (Route 11)	FARC 56-40 RC 56-41	Cicero-Brewerton, S.H. 5249; Central Square-Union Square, S.H. 5415; Union Square-Pulaski, Pt. 1 and Pt. 2, S.H. 5083-5221; Pulaski-Sandy Creek, S.H. 5275 Proj. No. F463(11)	26.05	Asp. Conc. Ty. 1A	$45,000 Plans $10	806,000
Seneca (Routes 5 and 20)	FARC 56-38 RC 56-39	Geneva-Waterloo, S.H. 5087; Geneva-Waterloo, Pts. 2 and 3, S.H. 8240. Proj. No. F406(4)	1.58	Asp. Conc. Ty. 1A	$6,000 Plans $10	111,000
Tompkins (Route 34)	FARC 56-46	Esty Glen-South Lansing, S.H. 5256 Proj. No. F447(5)	3.08	Asp. Conc. Ty. 1A	$6,000 Plans $10	119,000
Tompkins (Route 13)	FARC 56-37	Groton Village; Freeville Village; Dryden Village, S.H. 1002. Proj. No. F513(5)	1.33	Asp. Conc. Ty. 1A	$4,300 Plans $10	77,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, 65 Court Street, Buffalo N. Y.						
Erie (Routes 18 and 62)	FARC 56-45	Niagara Falls-Buffalo, Pt. 5 and Pt. 4, S.H. 5193-5172 Proj. No. F500(6)	4.56	Asp. Conc., Opt.	$24,000 Plans $10	436,000
DISTRICT No. 8, KURT G. RAUER, Acting District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Orange (Route 17K)	R.C. 56-43	Montgomery Village: Ward, Bridge, and Union Sts. S.H. 1675	....	Demolition	$150 Plans $10	2,500
Westchester (Thruway)	FANETC 56-4 FASTC 56-7	New York State Thruway, New England Section, Sub. NE 4 (North St. to Boston Post Road) and 5 Access or Cross Roads. Proj. No. IN-1068(12)	1.43 (0.08 Acc.)	9" Cem. Conc. Pavt. 2 @ 37' Var. Wide=1.29 Mi.; Asp. Conc., Opt.=0.14 Mi.; Asp. Conc., Opt. (Access Roads)=0.08 Mi.; 3 Hy. Seps. Comp. I-Beams 111.8' 54.5', and 409.1'; 1 Conc. Arch Br. 25.5'	$150,000 Plans $100	2,650,000
DISTRICT No. 10, M. E. GOUL, District Engineer, 325 West Main Street, Babylon, L. I., N. Y.						
Queens (Route 25D)	FA HHE 56-1	Horace Harding Expressway, Section 1, Contract 4 Proj. No. U-862(8)	1.09 (2.56 Acc.)	9" Cem. Conc. Pavt. with Carbon Black 72' Var. Wide=1.06 Mi.; 9" Cem. Conc. Pavt. (Acc. Rds.)=0.12 Mi.; Asp. Conc., Opt. (Acc. Rds.)=2.44 Mi.; Misc. Work=0.03 Mi.; 2 Hy. Seps. Comp. I-Beams 121.7' and 116.3'; 1 Ped. Overpass I-Beam 129'	$280,000 Plans $100	5,068,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: June 22, 1956

Niagara Falls Bridge Commission

NIAGARA FALLS, NEW YORK

NOTICE IS HEREBY GIVEN that sealed bids for painting the Superstructure of the Steel Arch Span of the Rainbow Bridge over the Niagara River between Niagara Falls, New York and Niagara Falls, Ontario will be received by the Niagara Falls Bridge Commission at its offices in Niagara Falls, New York until Three O'clock P.M. E.D.T. on June 22, 1956 and immediately thereafter will be publicly opened and read aloud. Bids shall be made on the prescribed forms and shall be enclosed in an opague sealed envelope addressed to the Commision and endorsed with the name of the bidder and the title "Bid for the Painting of the Rainbow Bridge."

Prices for the work shall be stated in United States money. Because of the International aspect of the work, the bidder shall inform himself of requirements pertaining to the employment of labor and ordinances which may affect the work and the Contractor's operations under the Contract.

The Bidder shall submit with his proposal a list of structures similar to the Rainbow Bridge which he has successfully painted during the past seven years, together with the name, title and address of the owner's representative who was directly in charge of such work so that the Commission may ascertain to its satisfaction that the bidder is well qualified to undertake the work required under the Contract.

Each proposal shall be accompanied by bid security in the form of a certified check payable in United States monies upon a State or National Bank or Trust Company, drawn to the Order of the Commission and in an amount not less than five (5) percent of the Guaranteed Upset Price bid.

The work will be awarded, if an award is made, within thirty days after the opening of bids. The work shall be completed on or before September 30, 1956. Liquidated damages in the amount of $100 will be assessed for each and every calendar day the Contractor is in default in completing the Contract. The Commission reserves the right to reject any or all bids.

Contract Documents including Information For Bidders, Proposal, Contract Agreement, Contractor's Bond and Detailed Specifications may be obtained from the Commission upon making a deposit in the amount of Ten (10) Dollars. The deposit will be refunded in full upon the return of the documents in good condition.

Niagara Falls Bridge Commission
By C. Ellison Kaumeyer
General Manager

June 4, 1956

Bids: June 22, 1956

City of Willimantic, Willimantic, Connecticut

INVITATION TO BID.

Separate sealed bids for the construction of about 11,000 linear feet of sanitary sewer, with a complete pump house and equipment, will be received at the City Clerk's Office, City Hall, Willimantic, Connecticut, until 5:00 o'clock P.M. D.S.T., June 22, 1956 and there at said office, publicly opened and read aloud.

Each bid will be in accordance with the requirements of the contract documents which are available at the office of the City Clerk. Particular attention is called to the wage requirements of this project. The City of Willimantic, by it's Mayor and Standing Committee on Sewers, reserves the unqualified right to reject any and all bids, waive any informalities in, or to reject that bid which will in the judgment of the Mayor and the Standing Committee on Sewers, best serve the interest of the City of Willimantic.

CITY OF WILLIMANTIC
Florimond J. Bergeron, Mayor

Bids: June 19, 1956

City of Richmond, Virginia

NOTICE TO BIDDERS

Sealed proposals will be received at the office of the Director of Purchases and General Services, Fourth Floor, Mosque Building, Laurel and Main Streets, Richmond 20, Virginia, until but not later than 11 o'clock A.M., E.S.T., June 19, 1956, at which time they will be publicly opened and read aloud for the following work, which may be awarded in whole or in part:

Type of Work: The work to be done is part of the Sewage Disposal Project, is entitled "Division L—Cary Street Road Intercepting Sewer Part 1" and comprises the construction of approximately 2,929 linear feet of 48 inch and approximately 4,473 linear feet of 42 inch reinforced concrete culvert pipe sewer, complete with manholes house connections, junction chambers, siphon and all other structures, as shown, specified and directed.

Location: The sewer is to be constructed in Cutshaw Avenue from Belmont Avenue northwesterly to Thompson Street in right of way (Cutshaw Avenue extended) from Thompson Street northwesterly to Hamilton Street, in right of way adjacent to the east line of Hamilton Street from Cutshaw Avenue southwesterly to Floyd Avenue, and in Hamilton Street from Floyd Avenue southwesterly to Cary Street Road, in the City of Richmond, Virginia.

The proposal and other contract documents may be examined at the office of the Director of Public Works, 217 Governor Street, Richmond, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of the contract documents may be obtained from the office of the Director of Public Works upon the deposit of Twenty-Five Dollars for each set. Any general contractor who submits a bona fide bid on the project will be refunded his payment in full for not more than three sets, and will be refunded fifteen dollars per set for each additional set. All others will be refunded fifteen dollars per set upon the return of the documents in good condition within ten days after the opening of the bids.

J. W. Huffman
Director of Purchases
and General Services

Bids: July 6, 1956

Commonwealth of Puerto Rico
Department of Public Works

NORTH EXPRESSWAY PUMPING STATION
MUNICIPALITY OF SAN JUAN, P. R.
ADVERTISEMENT
May 21, 1956

The Board of Awards of the Department of Public Works of Puerto Rico will receive sealed proposals for the furnishing of equipment for and constructing the North Expressway Pumping Station, Municipality of San Juan, Puerto Rico.

Bidders shall submit their proposals at the office of the Board of Awards in the Department of Public Works until 2:00 P. M. (Puerto Rico time) on July 6, 1956 at which time and place said proposals will be publicly opened and read aloud.

The work to be performed is divided into four (4) sections under which the work is classified according to its character. The principal items of work are as follows:

Section A—Furnishing and delivering C.I.F. San Juan, Puerto Rico, four (4), five (5) or six (6) electric motor driven drainage pumping units, one (1) of fifty thousand (50,000) gallons per minute capacity and three (3), four (4) or five (5) of one hundred thousand (100,000) gallons per minute capacity, complete with their motors, mechanisms and appurtenances, together with the services of an expert to supervise the installation and testing of the equipment.

Section B—Furnishing and delivering C.I.F. San Juan, Puerto Rico, one (1) thirty (30) tons capacity gantry crane with one (1) two (2) ton capacity auxiliary hoist, having a span of six (6.0) meters center-to-center of rails and a maximum lift of seven (7) meters above the tops of rails, together with the services of an expert to supervise the installation and testing of the equipment.

Section C—Constructing the North Expressway Pumping Station including receiving and suction well, superstructure, outside connecting piping, roadways and paths, grading, fencing, miscellaneous structures and appurtenances and the installation of pumping equipment and the gantry crane furnished by others.

Section D—Furnishing and installing all electrical equipment, wiring and controls required for the North Expressway Pumping Station including switchgear, switchboards, controls, conduit, wiring, connections and accessories.

Copies of the plans, specifications and instructions to bidders may be examined without charge at the office of the Procurement and Contracts Division of the Department of Public Works or at the offices of Buck, Seifert and Jost, Consulting Engineers, 223 Manuel V. Domenech Street, Hato Rey, Puerto Rico and 112 East 19th Street, New York 3, N. Y. Copies thereof may be obtained at the office of the Procurement and Contracts Division of the Department of Public Works or at the office of Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, N. Y. upon a deposit of TWENTY ($20.00) DOLLARS in cash, money order or certified check payable to the Secretary of the Treasury until one (1) week prior to the opening of bids. The full amount of the deposit will be refunded to each depositor upon the return of the plans in good condition within twenty (20) days after the opening of bids.

Each proposal must be accompanied by a provisional bond in the amount set forth below in any of the forms indicated in the instructions to bidders:

Section A—EIGHT THOUSAND ($8,000.00 DOLLARS
Section B—ONE THOUSAND ($1,000.00) DOLLARS
Section C—THIRTEEN THOUSAND ($13,000.00) DOLLARS
Section D—TWO THOUSAND ($2,000.00) DOLLARS

The Board of Awards reserves the right to accept any bid or to reject any or all bids and to award any contract under the conditions found most favorable to the Commonwealth of Puerto Rico.

BUCK, SEIFERT AND JOST
Consulting Engineers

ROBERTO SANCHEZ VILELLA
Secretary of Public Works

Bids: June 21, 1956

Mackinac Bridge Authority

Advertisement for Proposals
for the
Construction of the Deck Concrete and Asphalt and St. Ignace Approach Viaduct Substructure
for
Mackinac Straits Bridge

The Mackinac Bridge Authority will receive sealed proposals for the construction of Contract No. 3, Deck Concrete & Asphalt and St. Ignace Approach Viaduct Substructure, for the Mackinac Straits Bridge until 10:00 A.M. Eastern Standard Time on the 21st day of June, 1956, at the office of the Authority, 608 Prudden Building, Lansing, Michigan, at which time and place proposals will be publicly opened and read aloud.

The work of Contract No. 3, Division A, includes the construction of the concrete deck and asphalt surfacing for two 23-ft. wide roadways, together with walkways, on the suspension spans and truss span approaches of this bridge.

The bridge consists of the south approach truss spans 5693.5 feet in length from Pier 1 to the south anchorage; the north approach truss spans 3609.5 feet from Pier 34 to the north anchorage; two anchorages 135 feet in length; two backstay spans 472 feet in length, two suspended side spans eighteen hundred (1800) feet in length, and the main suspended span thirty-eight hundred (3800) feet in length.

The principal items of work include:

	Approximate Quantities
Bituminous Concrete	6,025 Tons
Grade A Concrete	11,540 Cu. Yds.
Lightweight Concrete	2,030 Cu. Yds.
Steel Reinforcement	2,638,000 Lbs.

The work of Contract No. 3, Division B-1, includes the construction of thirteen concrete piers and one concrete abutment, fifty feet on centers on the existing causeway, with the first pier located approximately sixty feet from the outshore end of the causeway and north of the north truss spans. The piers and abutment are each supported on two concrete pile caps resting on piles driven to rock bearing.

The principal items of work include:

	Approximate Quantities
Earth Excavation	1,500 Cu. Yds.
Grade A Concrete	1,300 Cu. Yds.
Steel Reinforcement	200,000 Lbs.
Piles	
Alternate A. 12" B.P. 53#	10,320 Lin. Ft.
Alternate B. 14" B.P. 117#	6,360 Lin. Ft.
Alternate C. Cast-in-place Concrete	13,200 Lin. Ft.

The work of Contract No. 3, Division B-3, includes the construction of the Concrete Deck and Asphalt surfacing for the St. Ignace Approach Viaduct.

This structure is a highway beam viaduct extending approximately 700 feet north of the north truss span Pier 34. The viaduct deck consists of two 23-foot concrete roadways with a bituminous concrete surfacing, separated by a two-foot center mall, with curb and sidewalk each side.

The principal items of work include:

	Approximate Quantities
Bituminous Concrete	300 Tons
Grade A Concrete	930 Cu. Yds.
Steel Reinforcement	163,000 Lbs.

Plans, Specifications, Proposal Form and Contract Documents for the work are on file in the office of the Mackinac Bridge Authority and in the office of D. B Steinman, Consulting Engineer, 117 Liberty Street, New York 6, New York, and may be inspected by prospective bidders during office hours.

Plans Specifications, Proposed Form and Contract Documents may be obtained from D. B. Steinman, Consulting Engineer, 117 Liberty Street, New York 6, New York upon application and payment of a fee of twenty-five ($25.00) dollars, fifteen ($15.00) dollars of which will be refunded upon return of the Plans to non-bidders, and all of which will be returned to bidders.

Bids must be made upon the proposal form included in the Contract Documents. Each proposal must be accompanied by draft or certified check payable to the order of the Mackinac Bridge Authority for the sum of one hundred thousand ($100,000.00) dollars.

MACKINAC BRIDGE AUTHORITY
Prentiss M. Brown, Chairman
May 31, 1956

Bids: July 17, 1956

Philadelphia, Penna.
Procurement Department
Water Department

Sealed proposals will be received in Room 313, City Hall Annex, until 2:30 P.M., Daylight Saving Time, Tuesday, July 17, 1956, and opened at that time, for the below named contracts:

RAPID SAND FILTER
SUPERSTRUCTURE
AT
TORRESDALE FILTER PLANT
DESCRIPTION OF WORK

These contracts cover all superstructure work above elevation 230.00, namely the top of concrete of existing structures for Filter Plant and Office Building and all interior masonry facing, exterior steps and complete transformer room footings and floors below elevation 230.00. Outside dimensions of Filter Building are approximately 554' x 295' with parapet heights overfilters of approximately 17'6" and over galleries of approximately 26'. Outside dimensions of Office Building are approximately 102'6" x 51'0", two stories, with parapet height of approximately 26'. The work will consist of all structural steel, masonry, marble, tile and cut stone, floors, metal and iron work, wiring systems for electric power controls and lighting, heating, ventilating and dehumidifying equipment, plumbing and electrical equipment.

Proposal forms, specifications, questionnaires and blueprints may be obtained from the Water Department, in Room 1131 City Hall Annex, Juniper Street and Filbert Street, Philadelphia 7, Penna. A deposit in cash or certified check is required in the amounts stated after each contract, for each set of blueprints and specifications. This deposit will be refunded upon return of the blueprints, unmarked and in undamaged condition within ten (10) days after bids are received.

Bid No. 2618—Contract No. 189-W—Superstructure	$25.00
Bid No. 2619—Contract No. 191-W—Heating and Ventilating	$15.00
Bid No. 2620—Contract No. 190-W—Electric System	$15.00
Bid No. 2621—Contract No. 707-W—Electrical Equipment	$10.00
Bid No. 2622—Contract No. 192-W—Plumbing	$10.00

No bids will be received unless bidder is qualified by the Procurement Commissioner. The questionnaire form with all questions fully answered must be filed with the Water Commissioner, 1106 City Hall Annex, Philadelphia 7, Penna., at least one (1) week prior to the date of opening bids. Each proposal must be accompanied by security in form and amount as set forth in the proposal.

MICHAEL H. SURA
PROCUREMENT COMMISSIONER

Bids: June 15, 1956

Notice of Letting of Drain Contract

FOR THE LOCATING, ESTABLISHING AND CONSTRUCTING OF THE LEFLER READY SANITARY DRAIN IN THE TOWNSHIP OF DEARBORN, WAYNE COUNTY, MICHIGAN.

NOTICE IS HEREBY GIVEN, That I, CHRISTOPHER J. MULLE', County Drain Commissioner for the County of Wayne, State of Michigan, will now and until 11 o'clock in the forenoon of the 15th day of June, A. D. 1956, in the office of the Wayne County Drain Commissioner, 3523 Cadillac Tower, Detroit 26, Michigan, proceed to receive sealed bids for the construction of a certain drain known and designated as the "LEFLER READY SANITARY DRAIN", to be located and established in the Township of Dearborn, in said County, at which time bids will be publicly opened and read by Christopher J. Mulle', the Wayne County Drain Commissioner.

Said drain is divided into FIVE (5) SECTIONS. Contract will be awarded for all work listed in Sections 1 through 5, which includes the project in its entirety. Stations are 100 feet apart.

SECTION NO. 1—TRUNK DRAIN

Beginning at station number 0 + 00 at the lower end of said drain and extending to station number 147 + 49, a distance of 14,749 feet, and having an average depth of 23.4 feet.

SECTION NO. 2—ARM NO. 1

Beginning at station number 0 + 00 at the lower end of said drain and extending to station number 2 + 19, a distance of 219 feet, and having an average depth of 13.8 feet.

SECTION NO. 3—ARM NO. 2

Beginning at station number 0 + 00 at the lower end of said drain and extending to station number 0 + 11, a distance of 11 feet, and having an average depth of 14.0 feet.

SECTION NO. 4—ARM NO. 3

Beginning at station number 0 + 00 at the lower end of said drain and extending to station number 41 + 83, a distance of 4,183 feet, and having an average depth of 20.3 feet.

SECTION NO. 5—ARM NO. 4

Beginning at station number 0 + 00 at the lower end of said drain and extending to station number 0 + 30, a distance of 30 feet, and having an average depth of 8.8 feet.

In the construction of said drain the following quantities and character of tile or pipe will be required and contracts let for same:

2,595 feet of 30 Inch R.C.P. (C-76-2) Concrete Encasement
4,594 feet of 24 Inch R.C.P. (C-76-2) Concrete Encasement
2,310 feet of 21 Inch R.C.P. (C-76-1) Concrete Encasement
1,297 feet of 21 Inch R.C.P. (C-76-1) Concrete Cradle
1,259 feet of 18 Inch R.C.P. (C-76-1) Concrete Cradle
2,694 feet of 15 Inch R.C.P. (C-76-1) Concrete Cradle
1,728 feet of 15 Inch R.C.P. (C-76-2) Concrete Cradle
645 feet of 12 Inch R.C.P. (C-76-1) Concrete Cradle
1,810 feet of 12 Inch Pipe (C-200) Concrete Cradle
57 feet of 8 Inch C.I. Pipe Class 150
11 feet of 8 Inch Pipe (C-200) Concrete Encasement
100 feet of 8 Inch Pipe (C-200) Concrete Cradle
92 feet of 8 Inch Pipe (C-200)
12 Each Manholes Under 18 ft. Deep
24 Each Manholes Between 18 and 24 ft. Deep
25 Each Manholes Over 24 ft. Deep
1 Each Manholes Between 18 and 24 ft. Deep with 2 Drop Connections
4 Each Manholes Over 24 ft. Deep with 2 Drop Connections
1 Each Diversion Manhole Under 18 ft. Deep
3 Each Diversion Dams in Existing Manholes

Said job will be let in accordance with the diagram now on file with the other papers pertaining to said Drain in the Office of the County Drain Commissioner for the County of Wayne, to which reference may be had by all parties interested, and bids will be made and received accordingly. Contract will be made with the lowest responsible bidder giving adequate security for the performance of the work, reserving to myself the right to reject any and all bids or proposals and/or to adjourn such letting to such time and place as I shall publicly announce.

The Drain Commissioner shall have the right to hold all bids for a period of sixty days after the opening thereof. No bidder shall have the right to withdraw his bid during such time.

The Drain Commissioner shall, within the period of sixty days herein provided for the holding of bids, obtain the approval of the Wayne County Board of Auditors to the letting of the contract to the lowest responsible bidder, and shall notify such bidder of his award of the contract. The Drain Commissioner shall be given ninety days from the date of notification to the contractor of the acceptance of his bid to sell bonds in an amount sufficient to pay for this proect, it being understood that if the Drain Commissioner shall not have marketed bonds in an amount sufficient to pay for this project within such ninety day period, no contract shall be executed. If within such ninety day period the Drain Commissioner shall successfully sell bonds in an amount sufficient to pay for the project, the Drain Commissioner shall forthwith notify the successful bidder of such sale and an agreement awarding the contract to the successful bidder shall be executed within ten days from the date of notice of the sale of bonds. The bid, of the successful bidder, and the bond securing the same, shall remain in full force and effect until the contract is executed. If the bonds hereinbefore required to be sold are not marketed within the period provided above, or notice of such sale is not given by the Drain Commissioner to the successful bidder within the specified time, the bid shall be deemed to be null and void and the bid deposit shall be returned to the successful bidder.

The ninety day period provided above for the sale of bonds and the giving of notice thereof may be extended from time to time by mutual agreement between the successful bidder and the Drain Commissioner.

The successful bidder shall not be required to execute performance bond, material lien bond, or provide the insurance herein otherwise required until he shall first have been notified of the sale of the bonds by th Drain Commissioner, and upon receipt of such notice, the successful bidder shall be required to execute and deposit such bonds and insurance as are required by the terms of the contract the time of the execution thereof.

Copies of the plans and specifications may be secured from the Office of the Drain Commissioner of the County of Wayne, Michigan at 3523 Cadillac Tower, Detroit 26, Michigan.

Any person desiring to bid on the above mentioned work will be required to deposit with the County Drain Commissioner a certified check, bank draft, cashier's check or bond payable to the Drain Commissioner of the County of Wayne, Michigan, in an amount equal to five per cent (5%) of the bid as a guarantee that he will enter into contract and furnish the required bond at the time and in the manner hereinbefore provided.

A deposit of Fifteen Dollars ($15.00) will be required for each set of plans and specifications, which said deposit will be refunded upon the return of said plans and specifications in good condition within 15 days after the award of the contract. The payments for the above-mentioned work will be made as follows: IN CASH, FROM THE RECEIPTS OF THE SALE OF BONDS. Contractor may draw up to 80% of work completed from time to time and upon approval of the engineer.

Taxes will be spread in thirty (30) installments. First installment due and payable the 1st Day of December, 1956.

Dated this 19th Day of May, A.D. 1956.

CHRISTOPHER J. MULLE'
Wayne County Drain Commissioner.

Bids: June 15, 1956

Power Authority of The State of New York

ST. LAWRENCE POWER PROJECT
ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF TRASH RACKS, STOP LOGS, LIFTING BEAMS AND GATE SUSPENSION METALWORK
FOR
BARNHART ISLAND POWER PLANT, LONG SAULT DAM AND MASSENA INTAKE
SPECIFICATIONS NO. PA-5-15055
ST. LAWRENCE CONTRACT NO. P39

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the manufacture and furnishing of two hundred and forty (240) trash racks, thirty-four (34) stop logs, four (4) lifting beams and one lot of gate suspension metalwork and delivery thereof f.o.b. destination in the following ways:

(1) If brought in person on the day of receiving bids until 10:30 A.M., Eastern Daylight Saving Time on the 15th day of June, 1956, 270 Broadway, Hearing Room C on the sixth floor, New York 7, New York.

(2) If mailed in, until 10:15 A.M., Eastern Daylight Saving Time, on the 15th day of June, 1956, at the Authority's Office, 270 Broadway, Room 1300 New York 7, New York.

The proposal will be publicly opened and read aloud at the time and at the address given in (1) above.

Bids will be entertained for fabricated steel metalwork having a total weight of approximately 1200 tons.

Bids will not be restricted to American manufacturers.

Plans, specifications and proposal forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Twenty ($20.00) dollars per initial set of contract documents and Ten ($10.00) dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid.

Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents. A bid deposit will be required with each bid in an amount not less than 10 percent of the gross sum bid in the bid schedule.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

INVITATION FOR BIDS

Item #1—Sale of one Ellicott Portable Hydraulic Dredge with 12" suction and 10" discharge. Complete with 600 ft. of floating discharge line, pontoons, 2000 ft. of shore line, and other accessories, and appurtenances necessary to make a complete and efficient dredging plant.

Item #2—Sale of one diesel powered dredge tender with steel hull, and mounted "A" frame.

Both units are in excellent condition and may be seen at the Jefferson County Drainage District #7 Pump Station, located near the intersection of Highway #69 and the Port Arthur Seawall.

Plans, specifications and performance data may be seen at the office of Jefferson County Drainage District #7, 317 Adams Building, Port Arthur, Texas. Inventory of equipment, spare parts, etc., will be supplied to prospective bidders on request.

All bids must be accompanied by a bid bond consisting of a certified or cashiers check made payable to Jefferson County Drainage District #7, Port Arthur, Texas, in the amount of not less than five per cent (5%) of the total bid. Bids must be submitted in triplicate, and addressed to Jefferson County Drainage District #7, P. O. Box 488 Port Arthur, Texas. Bid bonds will be returned to the unsuccessful bidders.

Bids may be submitted on items #1 and #2 either as a unit, or separately.

The Drainage District reserves the right to reject any or all bids, or to waive any informality as its interests may require.

The equipment is to be sold afloat at its present location. Dismantling and shipping costs shall be born by the purchaser.

Bids will be opened at the Drainage Districts office, 317 Adams Building, Port Arthur, Texas, on **June 11**, 1956 at **5:30** P. M.

JEFFERSON COUNTY DRAINAGE
DISTRICT NO. 7
M. A. Furth
M. A. Furth, Chairman

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

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Subject to Agency Commission.

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Complete resume including education, experience, present salary, and late photograph if available should be sent to:

HAROLD E. MILLER
Technical Director
West Virginia Pulp & Paper Company
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ENGINEERS

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Please give detailed personal and experience record, references and salary expected in application letter.

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2 Rector Street New York 6, New York
21st Floor DI 4-4400 Ext 8494

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P-1941, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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Structural, Highway & Railroad

Salary commensurate with qualifications. Submit resume to

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P-1904, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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LEONARD S. WEGMAN CO.
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REPLIES (Box No.): Address to office nearest you
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Mechanical and Piping Erection Superintendent for sewage treatment and filtration plant construction. Midwestern contracting firm specializing in this work has permanent position open. Please give experience and full details in reply. Replies will be held confidential if requested. P-1719, Engineering News-Record.

Engineers experienced in design and supervision of construction to work as resident engineers or prepare plans for water and sewer systems; also, architects for preparation of plans for general building work. State experience, age, salary required, when can report, and give references. Reply P-1800, Engineering News-Record.

Project Engineer with estimating ability and management potential for main office of Midwestern General Contractor, permanent position with growing organization. State experience, age, salary, when can report and references. P-1668, Engineering News-Record.

Building Construction Superintendent for Midwest General Contractor in heavy industrial and institutional construction; growing organization. State experience, age, salary, when can report and references. P-1671, Engineering News-Record.

100 Civil Engineer Vacancies—The Michigan Civil Service Commission is currently recruiting to fill a large number of positions in the State Highway Department created by an expansion in the road construction program from $70 million in 1955 to $150 million in 1956. A comprehensive Engineer Trainee Program is offered to graduates of accredited engineering colleges. The program continues for 12 to 18 months including seven week assignments in each of the following: Bridge Construction, bridge design, road construction, road design, road surveys, maintenance, planning and traffic and testing and research (Soils). One hundred and ninety-one persons have entered this program in the last seven years. One hundred and thirty-two remain. The figures speak for themselves. Job opportunity, promotion, 40 hour work week, security, social security, state pension plan, vacation, sick leave and many other benefits generally available only under a progressive civil service system are yours when you work for the Michigan State Highway Department. Salary for the Engineer Trainee Program starts at $4600 plus $20 weekly expense allowance while on most training assignments with 6 months increases to $5200 in 18 months. First promotion brings salary range with maximum of $6800. Next promotion to project engineer carries salary at maximum of $8150. Write for application for Engineer Trainee I to Michigan Civil Service, Recruitment and Placement, Lansing 13, Michigan.

Wanted—Salesman, heavy construction equipment. Los Angeles distributor leading exclusive lines—protected geographical area—salary, commission, car and expenses. Reply P-1732, Engineering News-Record, 68 Post St., Los Angeles, Calif.

Architectural or engr. draftsman, experienced. Monroe, Licht & Higgins, Arch.-Engr., 827 E. Yandell Blvd., El Paso, Texas.

Designers & Draftsmen—Structural, electrical, piping air cond., & arch. industrial buildings and power plants. Marbarry, 120 Greenwich St., N.Y.C. RE-2-3749.

(Continued on page 171)

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Write, giving full particulars regarding personal history and work experience. Please include your telephone number.

Recruiting Supervisor, Box 93

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Two graduate, licensed Civil Engineers with at least 10 years experience in design and preparation of plans and specifications for Sanitary Public Works Engineering projects, including water and sewage treatment plants and distribution systems.

Two engineering draftsmen experienced in preparation of plans for Sanitary Engineering projects.

P-1842, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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For Sewer and Water Line, Treatment Plant Construction: South Florida experience essential. Aggressive with proven qualifications. Able to coordinate inside and outside. Good salary and bonus opportunity.

P-1821, Eng. News-Record, 330 W. 42 St., N. Y. 36

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Immediate permanent positions are available in our Cleveland, Ohio office for applicants who have an engineering degree or equivalent in design and/or field experience. In addition must have take-off and pricing experience on all types of industrial and commercial buildings, and/or electrical installations.

These positions offer an opportunity to become associated with one of the country's foremost industrial engineering and construction companies. In addition to a good starting salary we offer excellent working conditions with paid vacations, sick leave accrual plan, company-sponsored insurance plan and overtime based on current 48 hour work week.

All replies will be treated confidential and arrangements will be made to interview selected applicants. Please submit complete reume stating experience, education, salary required and date available to:

P-1877, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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Designers, draftsmen, chiefs of party, specification writers — submit complete resume stating education, experience, salary desired and date of availability to

P-1603 Engineering News-Record
330 W. 42 St. New York 36, N. Y.

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Air Mail Resume TO, R. L. SHAW, *Personnel Director*

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BAKER BLDG. *Consulting Engineers* ROCHESTER, PA.

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P-1812, Engineering News-Record
330 West 42 St., New York 36, N. Y.

POSITIONS VACANT

(Continued from page 168)

Engineers on design of water and sewage treatment projects, in long established organization specializing in sanitary engineering and now interested in adding a few men to its permanent personnel. Location, Ohio. Experience in related fields considered applicable. State full information, experience, references. P-1868, Engineering News-Record.

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Superintendents, mechanical engineers and estimators needed by rapidly expanding mechanical contractor, specializing in industrial construction. Excellent opportunity for advancement in all fields. Submit resume of experience and availability with initial reply. P-1880, Engineering News-Record.

Construction Superintendent Wanted old well-known general construction firm operating in Central New York desires to negotiate mutually profitable agreement with a thoroughly qualified all-around construction superintendent who is also good at estimating, expediting etc. Must be between 25 and 35 years of age and a graduate civil engineer is preferred. Write P-1832, Engineering News-Record.

Chief estimator with well established Central Pennsylvania General Contractor. Send full information on experience, education, date available and salary requirements. We are mainly interested in industrial, commercial and institutional work. P-1816, Engineering News-Record.

Wanted: Experienced party chief for estab-lished engineering firm located along the East Coast of Florida. Must be able to take charge of all types of field work. Age 26-45. Permanent position. P-1782, Engineering News-Record.

Instructor—To teach undergraduate courses in applied mechanics. Opportunity to work on graduate degree in any engineering department. Salary depends on qualifications of applicant. Department of Applied Mechanics, University of Kansas, Lawrence, Kansas.

Assistant City Engineer: City of Owosso, Mich. Must be a graduate civil engineer or man with experience in surveying and drafting, with some design knowledge for general municipal engineering. Submit complete resume with salary requirements and earliest date available in first letter to City Engineer, Owosso, Michigan.

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Graduate Engineer to become City Engineer in a community of 22,000 population, which is a suburb of the City of Detroit. Engineer will be in charge of the Department and have control of all public works within the city. Need not be registered. Salary open, but in neighborhood $6,500.00 and $7,000.00. Applications to the City Manager, City Hall, 3322 Coolidge Highway, Berkley, Michigan.

Estimator on earth and concrete dams, for permanent position with old established San Francisco construction firm. Send resume in confidence. Our staff knows of this advertisement. Write P-1780, Engineering News-Record.

Mechanical and Piping Detailer for sewage treatment and filtration plant construction. Midwestern contracting firm specializing in this work has permanent position open. Please give experience and full details in reply. Replies will be held confidential if requested. P-1715, Engineering News-Record.

Engineers one or two years experience in structural design or recent graduates. Consulting engineers office Newark, N. J. Give education, experience and salary. P-8890, Engineering News-Record.

Architect, or Engineer with architectural background, with comprehensive knowledge of prefab panel or "skinwall" construction. Some sales and promotion experience desirable. Age requirement open, but 30-40 years preferable. Position with National Manufacturer of Building Materials involves introduction and promotion activities. Real opportunity for right man. Salary commensurate with position. Reply P-1937, Engineering News-Record.

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2 Graduate Civil Engineers: Must be capable of handling both Field and Office work in connection with design and construction of Sewers and Water Mains for municipally operated utilities, also, in connection with paving design and construction. 2 Engineering Aids: Excellent opportunity for undergraduate engineers to work with field parties and perform office work in connection with all phases of Municipal Engineering. All Salaries Open. Other benefits: Liberal Retirement Plan, sick leave, holiday and vacations. Excellent opportunities for advancement in rapidly expanding Department. Apply to: Gerald J. Lonergan, Personnel Officer, 26 Market Street, Mount Clemens, Michigan.

General Superintendent—experienced in steel cofferdaming, piling and reinforced concrete river work in Philadelphia. State references, salary, age and when can report. P-1907, Engineering News-Record

Superintendent—with engineering background —to become associated with a growing excavating-paving and flood control contractor in Western New York. As field superintendent the right man can build his own future. Sheridan Construction Corp., 3580 Sheridan Drive, Buffalo 21, New York.

Materials Engineers in several grades wanted by Mid-West consultants. Must know construction materials testing and inspection, including field control soils, and concrete. Furnish resume, salary requirements, availability, first letter. P-1840, Engineering News-Record.

Lehigh University has openings for Civil En-gineering staff members at ranks of Instructor, Graduate Assistant, and Research Assistant. If you are interested in gaining an advanced degree while serving in one of these positions, please write to: Dept. of Civil Engineering, Fritz Engineering Laboratory, Lehigh University, Bethlehem, Pennsylvania.

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General Superintendent-Project Manager-18 years experience on large commercial industrial and monumental building construction—Graduate Civil Engineer-desires permanent position with general contractor. East Coast location preferred. PW-1883, Engineering News-Record.

Senior Structural Engineer, thorough super-visory experience with large consulting & construction firms, power plants, chemical plants, large industrials, airfields, waterfront structures, dams, bridges, etc. Excellent estimator, spec. writer. Want permanent position with industrial firm or consultant. No. East or Mid-Atlantic states. PW-1869, Engineering News-Record.

Construction Executive-41-project manager, gen. supt., estimator, Reg. C.E., 20 year proven record. Special qualifications in organization and planning difficult work. Available for association with gen. contractor, Southeast. Opportunity and $14,000. PW-1742, Engineering News-Record.

Project Manager-General Superintendent 20 yrs. extensive experience in heavy construction—bridges, dams, industrial plants, public buildings. Currently completing large sewage disposal plant. Considerable following of key personnel all trades. Registered Engineer CE. Reply PW-1900 Eng. News-Rec.

Construction Engineer, 32 BSCE desires over-seas employment with family accommodations. Top construction man with wide experiences in heavy construction and industrial buildings. PW-1895, Engineering News-Record.

Construction Executive, buildings and heavy construction, sound experience bid to completion, qualified to manage a project, branch office or a business, seeks new connection where top man is required. Minimum $15,000. PW-8792, Engineering News-Record.

Energetic engineer, 42, civil graduate. Have supervised large projects as resident engineer six to fifty million in value. Require design or construction assignment in New York, Pittsburgh, Baltimore, Philadelphia, Cleveland, Detroit or Chicago. $9600 minimum. Experience on pulpmills, steam plants, large hangers, water and sewerage, airports, highways. PW-1911, Engineering News-Record.

Structural Engineer, licensed graduate, 30 years diversified design, and construction experience in subways, waterfronts, chemical plants, power plants, etc., available for responsible position. PW-1930, Engineering News-Record.

Engineer, registered N.Y.S., desired to relocate with small progressive consulting firm or town with opportunity for own practice. Highway, Sub-division, Sewage Treatment and Small town engineering experience. PW-1929, Engineering News-Record.

Superintendent, C.E. and Surveyor, 44, mar-ried, 22 yrs. field and office experience in heavy construction, mainly highways, railroads, bridges, irrigation and drainage. Worked on 3 continents. Fluent Spanish, French, German, Italian. Good organizer, desires position with progressive contractor or consultant, foreign or domestic. PW-1940, Engineering News-Record.

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Manufacturers Representative, former D.R. 10 years in Houston-Gulf Coast area, resume. References. RA-1801, Engineering News-Record.

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Work Wanted: a group of Professors would like to undertake design and checking of buildings, highway bridges, etc., WW-1901, Engineering News-Record.

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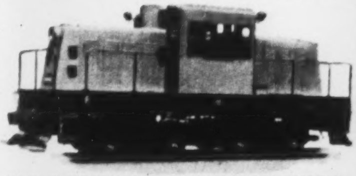

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Armco Drainage & Metal Products, Inc	2nd cover
Athey Products Corp.	38, 39
Atlantic Steel Corp.	140
Atlas Powder Co.	101
Automotive & Aircraft Div., American Chain & Cable Co.	14
Barber-Greene Co.	164
Barco Mfg. Co.	37
Baxter Co., J. H.	158
Bay City Shovels, Inc.	74
Bethlehem Steel Co.	115
Blaw Knox Equip. Div., Blaw Knox Co.	53
Borden Metal Products	22
Bower Roller Bearing Co.	157
Broderick & Bascom Rope Co.	4th cover
Bruning Co., Inc., Charles	33
Buchanan Lumber Co.	144
Bucyrus-Erie Co.	8
Butler Mfg. Co.	99
Case Foundation Co.	118
Celotex Corp., The	105
Clark Eqiup. Co., Const. Machy. Div.	148
Cleveland Trencher Co.	86
Clipper Mfg. Co.	9
Clow & Sons, James B.	112
Clyde Iron Works, Inc.	143
Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div.	65
Commercial Shearing & Stamping Co.	45
Concrete Surfacing Machinery Co.	104
Dart Truck Co.	89
Detroit Diesel Engine Div., G. M. C.	141
Dorr Oliver, Inc.	82
Dravo Corp.	145
Earle Gear and Machine Co.	104
Earth Equipment Corp.	118
Economy Forms Corp.	117
Enterprise Galvanizing Co.	137
Euclid Div., G. M. C.	16, 17
Eugene Dietzgen Co.	100
Faber-Castell Pencil Co., A. W.	179
Fairbanks-Morse Co.	3
Firestone Tire & Rubber Co.	87
Flexible Road Joint Machine Co.	126, 127
Tractor & Implement Div., Ford Motor Co.	13
Fort Pitt Bridge Works	4
Foster Co., L. B.	2
Gardner-Denver Co.	96, 97
Garrett Corp.	113
General Motors Truck Div., G. M. C.	106, 107
Golden Anderson Valve Co.	133
Goodrich Co., The B. F.	5
Griffin Wellpoint Corp.	117
Gunite Construction Corp.	122
Gunite Contractors Assoc.	137
Harbor Plywood Corp.	90, 91
Harnischfeger Corp.	11
Hendrick Mfg. Co.	140
Homelite Div., Textron American, Inc.	80, 81
Ingalls Iron Works Co.	139
Ingersoll Rand Co.	161
International Harvester Co.	83, 84, 85
Jaeger Machine Co.	116
Kinnear Mfg. Co.	122
Kit Mfg. Co., Inc.	103
Koehring Co., The	30, 31
LeRoi Co.	63
LeTourneau-Westinghouse Co.	119, 121, 123, 125
Link Belt Speeder Corp.	57
Lock Joint Pipe Co.	18
Lufkin Rule Co.	133
Lukens Steel Co.	147
Mack Trucks, Inc.	79
Madesco Tackle Block Co.	138
Marion Power Shovel Co.	77
Masonite Corp.	109
McConnaughay, K. E.	54
McKiernan-Terry Corp.	66
McKinney Drilling Co.	144
Mississippi Glass Co.	144
Moretrench Corp.	136
Morrison Steel Products, Inc.	78
Morse-Starrett Products Co.	98
Mueller Co.	162
National Gypsum Co.	131
Nelson Stud Welding Div., Gregory Industries, Inc.	64
Noble Co.	128
Oliver Corp.	20
D. W. Onan & Sons, Inc.	130
Patent Scaffolding Co.	35
Peerless Pump Div. of Food Machy. Corp.	43
Permacrete Products Co.	122
Portland Cement Assoc.	132
Posey Iron Works, Inc.	146
Puget Sound Fabricators, Inc.	103
Raymond Concrete Pile Co.	155
Republic Steel Corp.	58, 59
Reynolds Metal Co., Inc.	60
Richmond Screw Anchor Co., Inc.	135
Robertson Co., H. H.	88
Rockford Clutch Div., Borg-Warner	137
Roebling's Sons Corp., John A.	12
St. Paul & Tacoma Lumber Co.	76
Sauerman Bros., Inc.	10
Silicone Div., Union Carbide & Carbon Corp.	55
Sonoco Products Co.	94, 95
Standard Steel Spring Div., Rockwell Spring & Axle Co.	120
Stang Corp., John W.	47
Superior Lidgerwood Mundy Corp.	100
Templeton Kenly & Co.	70
Timber Structures, Inc.	142
Townsend Co.	152
Truck Mixer Mfr. Bureau	108
Truscon Laboratories	52
Union Oil Co.	92
Union Wire Rope Corp.	48, 49
Unit Crane & Shovel Corp.	150
U. S. Pipe & Foundry Co.	15
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U. S. Steel Corp.	72, 73
Universal Form Clamp Co.	111
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Waukesha Motor Co.	114
Winpower Mfg. Co.	120
Woodward & Dickerson, Inc.	98
Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc.	153
Worthington Corp.	6, 7
Professional services	**176-178**

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F. J. Eberle, Business Mgr.

Employment Opportunities	168-171
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Proposals	165-167
Equipment (For Rent, Sales Wanted)	172-175

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Moving Too Fast

FEDERAL AID IN THE SEWAGE FIELD should be deferred until a thorough study has been made to determine if and where it is needed, and in what amounts. This is the conclusion of a panel of experts intimately concerned with water pollution control, whose views are presented in some detail in a report starting on page 40 of this issue. It is a conclusion that should be accepted by Congress. And it should be agreed to by those who are urging the legislators to approve grants-in-aid for sewage works construction since the wrong kind of federal aid could slow rather than accelerate pollution control progress.

The federal aid proposal, which cropped up several weeks ago as a surprise provision in water control legislation before Congress, was sponsored by the American Municipal Association. Originally scaled to $1 billion in grants over a ten year period, this amount has now been reduced to $500 million. There is no evidence that either figure derived from any careful analysis of need.

A majority of the experts quoted in this issue are against the proposed federal aid. Yet they are not unalterably opposed to the principle, if a study should show that some cities would have to bear an unreasonable financial burden to achieve satisfactory pollution control—and if some formula can be devised to give such cities help and deny it to others who do not need it. The latter is the real crux of the matter, because a nonuniform disbursement of federal funds is difficult politically. And the alternative—the promise of generally available grants—holds the danger of curtailing the present rate of sewage works construction instead of increasing it.

Considering the uncertainties of the wisdom of embarking on a program of federal aid to cities for sewage works construction, the grants-in-aid provision of the legislation should be dropped. At the same time the remainder of the pending legislation designed to extend and strengthen the Water Pollution Control Act of 1948 should be passed before its expiration date of June 30.

With this much settled to assure the maintenance of the present rate of progress in sewage works construction, the U. S. Public Health Service could be designated to collect information from the states on the financing ability of all their communities now under order to construct sewage plants. To assure accuracy on this question of ability to pay, complete and up-to-date feasibility reports by qualified engineers should be used in every case. From such data it should be possible to total the cost of aiding all cities actually needing help, and to weigh this against the benefit that would accrue to the overall pollution abatement effort. Finally, if benefits appear to justify costs in a class of projects that could be built only at local expenditures far beyond a recognized norm, an attempt should be made to devise a formula by which federal funds could be disbursed.

Whatever federal funds are provided should stimulate local action and expenditure, not supplant it. This means that the possibilities of increased local revenues, of state aid, and of action on the much-discussed redistribution of taxing powers and tax revenues all should be reconsidered. The American Municipal Association, which conceived the current proposal of federal aid, could do much to explore and perhaps pave other avenues by which cities needing funds can find their way to them. The Federation of Sewage & Industrial Wastes Associations, whose membership encompasses nearly everyone concerned with the clean streams problem, could also add useful facts.

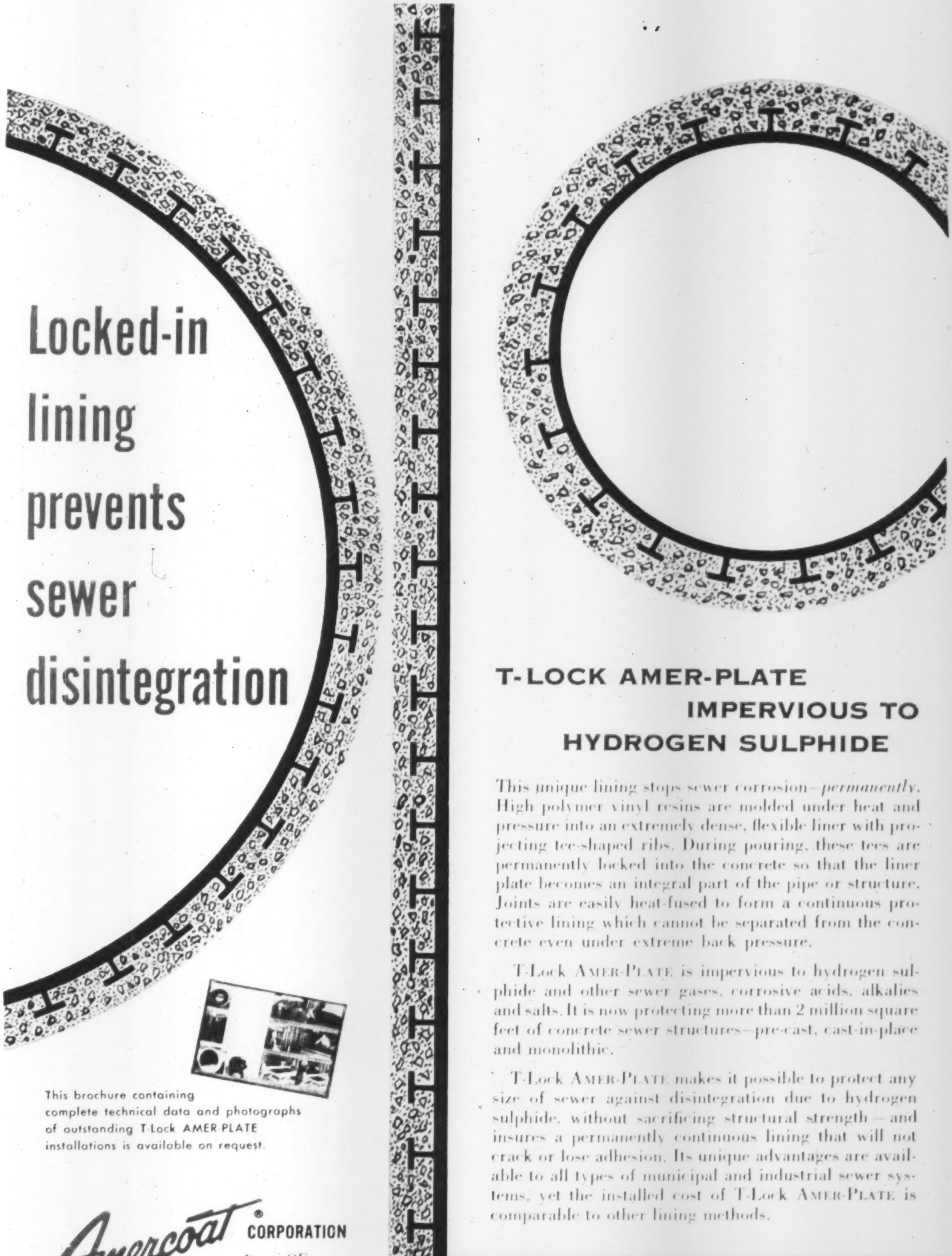
If all those concerned join forces now to establish whether federal aid to sewage works is needed and on what logical basis it might be administered, Congress will be in a much better position to rule on the question. As the situation now stands, Congress is being asked to move too fast.

Turnpikes Linked

THERE CAN BE NO DOUBT but that drivers of private automobiles in large numbers will use the newly opened link between the New Jersey and Pennsylvania turnpikes. No such certainty applies to truck operators. Hence the number of trucks using the new facility will be watched with great interest.

For some time past, it has been evident that truck operators were not using some toll highways to the extent anticipated by their builders (ENR Apr. 26, p. 21). The eastern extensions of the Pennsylvania Turnpike provide an outstanding example. The original turnpike furnished truck operators a superior route through the mountains of western Pennslyvania at very material savings in time and fuel consumption. When that turnpike was extended eastward, however, a large number of the truck operators continued to leave the turnpike after they got over the mountains, and to follow other routes into the New York metropolitan region.

Up to now this diversion of truck traffic has been held within bounds by the congestion encountered on the toll-free highways. Now, the new link between the Pennsylvania and New Jersey Turnpikes may reduce this congestion. What happens may have an important bearing on decisions relating to other connections such as those between the New York Thruway and the toll turnpikes in Ohio and Massachusetts.



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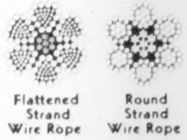

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